

LC1043 .P8
Vocational education in a democracy
Gutman Library APD6090



3 2044 028 967 016

HARVARD UNIVERSITY



**LIBRARY OF THE
GRADUATE SCHOOL
OF EDUCATION**

WITHDRAWAL

VOCATIONAL EDUCATION
IN A DEMOCRACY

The Century Vocational Series

Edited by Charles A. Prosser

VOCATIONAL EDUCATION IN A DEMOCRACY

BY

CHARLES A. PROSSER, PH.D.

Director of The William Hood Dunwoody Industrial Institute

AND

CHARLES R. ALLEN, A.M.

Federal Board of Vocational Education

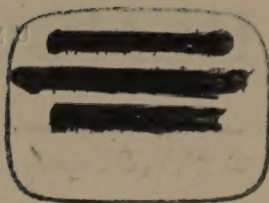


THE CENTURY CO.

NEW YORK & LONDON

1925

HARVARD
UNIVERSITY
LIBRARY



LC 1043

P8

HARVARD UNIVERSITY
GRADUATE SCHOOL OF EDUCATION
MONROE C. GUTMAN LIBRARY

Copyright, 1925, by
THE CENTURY Co.

Printed in U. S. A.

FOREWORD

For almost two decades, the authors have been closely associated personally and professionally in the work of vocational training. They have seen this movement develop from an idea into a recognized and established public policy. Before entering upon vocational education as a calling, both of them were engaged for a considerable time in the work of regular education—a field in whose aims and processes they have never lost their interest. In vocational education, they have frequently served as colleagues in the same enterprises. Sometimes they have been widely separated. At all times they have kept up a close connection with each other and with a rapidly developing, constantly changing field of service.

Circumstances have operated to give them an unusual opportunity for contact with the administrative and pedagogical problems which confront agricultural, home making and commercial schools and classes of almost every type, and a wide and intensive experience, almost unique in character, in the field of industrial and trade training. Connected at various times and in various capacities with public schools, with private schools, and with the training schemes of shops and factories, they have had at least an opportunity to see from a wide variety of angles the educational needs of the citizens of America; the relationship of vocational education to general education; and of both to the stability, progress and conservation of this democracy. These facts constitute whatever justification this book may have.

As a result of this experience and their close personal association, the authors have arrived at a meeting of minds upon certain convictions, certain principles and policies regarding both

regular and vocational education. These, they have undertaken to set forth in two books—the first on “Vocational Education in a Democracy” and the second on “Social Education in a Democracy” soon to follow. This book has to do with the underlying principles which the authors believe apply to all forms and grades of vocational education of secondary grade; with the policies which schools and occupations must adopt in order to meet the mass need for practical training in this country; and with the methods which must be used, if we are to develop, as we should, our priceless asset of human resources properly trained.

CONTENTS

CHAPTER	PAGE
I What is Vocational Training?	3
II The Economic Theory of Vocational Education	19
III Vocational Education and Human Resources	40
IV The Iron Man	69
V The Discovery and Placing of Ability—By Testing	106
VI The Discovery and Placing of Ability Through Training	128
VII The Training and Direction of Ability	150
VIII Present Theories in Vocational Education	192
IX Types of Vocational Schools	220
X The Adolescent Vocational School—and Its Organization	246
XI The Adolescent Vocational School and Its Operation	266
XII The Vocational School for Adults	299
XIII The General Continuation School	318
XIV Efficiency Factors in Vocational Education	368
XV Getting the Job Done	382
XVI Federal Aid to Vocational Education	423
XVII The Training of Teachers for Vocational Education of Less Than College Grade	487
Appendix	552
Index	571

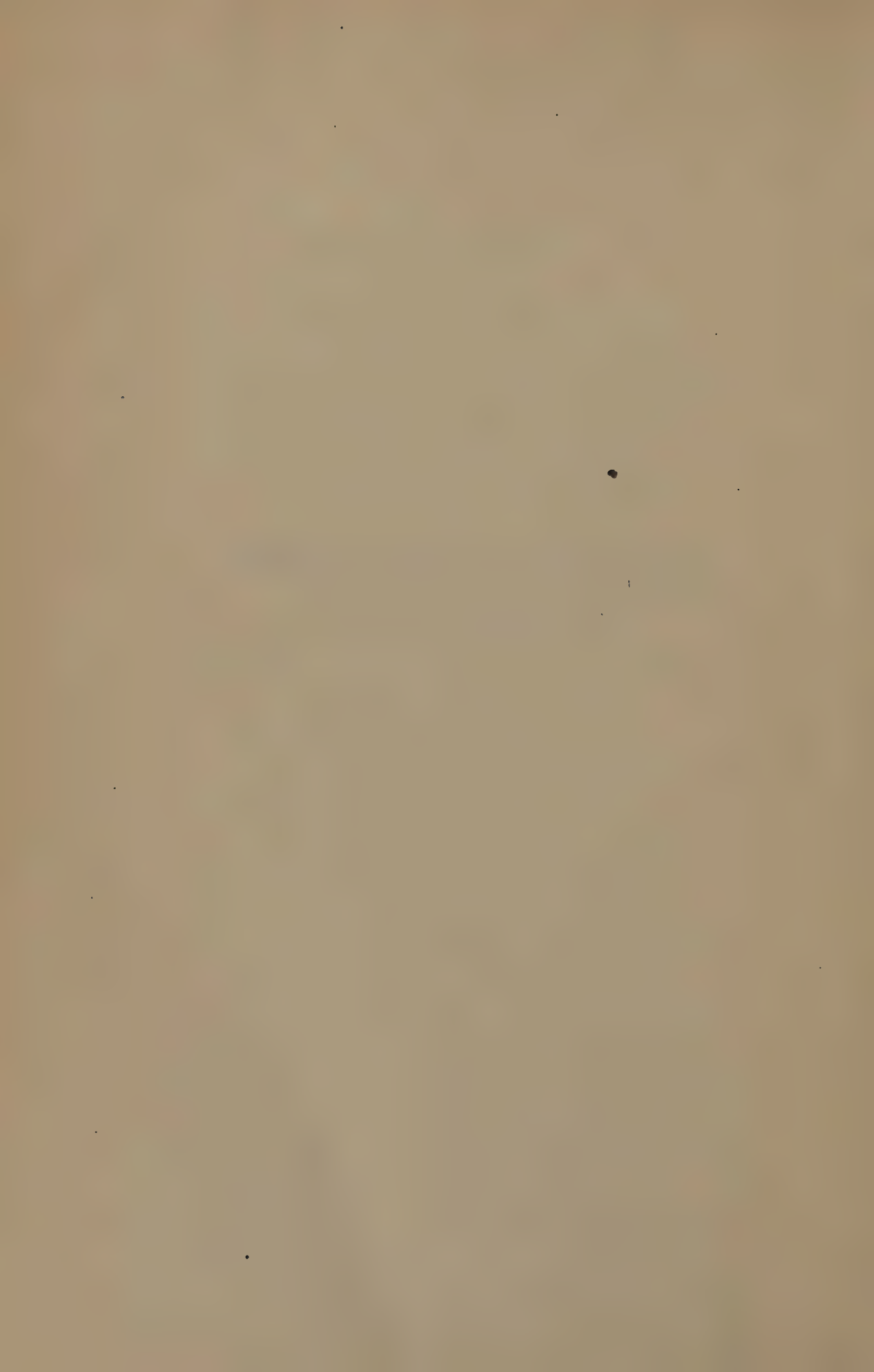
CHARTS

CHART	PAGE
1 Federally Aided Schools (1917-1924)—Showing Increase in Enrollment	90
2 Showing Problem of Correlating Subjects	274
3 Showing Correlation Through the Project Method	279
4 Showing the Comparative Needs of Two Permit Workers (A and B)	338
5 Comparing Plant and Outside School as Training Agencies . .	372
6 The Flow Sheet from School to Work	442
7 Numbers In and Out of School	443
8 Showing by Years Total Expenditures from National, State and Local Funds for the Operation of Federally Aided Schools (1918-1923)	444
9 Showing Comparative Increase in Total Funds and National Funds Expended on Federally Aided Schools (1917-1924) . .	445
10 Showing for Each Dollar of Federal Money Expended by the States for Federally Aided Schools—The Total Amount Expended by the States from all Sources on Such Schools . .	446
11 Showing Annual Increases in Number of Federally Aided Schools (1918-1923)	447
12 Showing Increases in Number of Teachers, Federally Aided Schools (1918-1923)	447
13 Showing Increase in Enrollment,—Federally Aided Schools (1918-1923)	448
14 Showing Increase in Teacher Training Institutions, Trainors and Trainees (1918-1922)	449

TABLES

TABLE	PAGE
1 Changing Conditions and Problems in Vocational Education .	29
2 Vocational Schools, Federally Aided by Years, Number of Schools, Teachers and Pupils	89
3 Rating Efficiency of Different Tests for Selecting Employees .	122
4 Relation of Training to Biological Progression	139
5 Comparative Analysis of Types of Vocational Schools	238
6 Real vs. Assumed Situation as to Part Time Pupils	330
7 Special Efficiency Devices	370
8 Showing Tendencies of Agencies in Use of Efficiency Devices .	376
9 Characteristics of Three Stages of Learning	384
10 Devices for Getting the Training Job Done and Their Efficiency Rating	388
11 Showing Comparative Tendencies in the Use of Different Train- ing Devices for Jobs of Different Grades	399
12 Comparative Efficiency of Training Schemes for the Mass Edu- cation of Beginners	403
13 Showing Mandatory and Discretionary Standards—Vocational Education Act	436
14 Characteristics of Teacher Training Plans	492
15 Showing Typical Curricula for Teacher Training	498
16 An Analysis of Typical Curricula for Teacher Training	499
17 The Competent Worker—The Vocational Teacher	508
18 An Evaluation of Teacher Training Plans Against Certain Effi- ciency Factors	518
19 Topics and Objectives for Part Time Schools	564

VOCATIONAL EDUCATION
IN A DEMOCRACY



VOCATIONAL EDUCATION IN A DEMOCRACY

CHAPTER I

WHAT IS VOCATIONAL TRAINING?

Education means many things to many men. To the classicist, it is the ability to derive enjoyment from the study of the writings of the ancient philosophers, poets and writers. To the culturist, it is the ability to enjoy the finer things of life. To the scientist, it often means a command of the special knowledge that goes with his specialty.

Lying back of all these conceptions, and of many more that have been held during the history of civilized mankind, has run an underlying idea, often obscured in educational controversy, but persisting nevertheless. This underlying idea may be expressed somewhat as follows: Education is the result of experiences whereby we become more or less able to adjust ourselves to the demands of the particular form of society in which we live and work. There may have been, and in fact there still are, differences of opinion as to what experiences will best lead to this social adjustment; but so far as the fundamental notion goes, it has always been accepted by most teachers. In this broad sense, the word education will be used in this book. It will signify the sum of all experiences which, in their results, so affect the habits, the thinking, the decisions of human beings that they are able to adapt themselves to their social environment and so meet its demands with at least some measure of success.

For untold ages the human race has been securing experiences. The sum of these experiences constitutes what has been called the "heritage of the race." Man has gradually learned how to live under the limiting physical conditions under which he must exist. Through long ages he has learned something of the control of natural forces and how to use them for his benefit. He has learned how to express his emotions in literature, in art, in poetry. He has learned something of how to organize himself into social groups so that cooperative effort may accomplish what the isolated individual can not do alone. And he has learned how to work!

All this mass of past human experiences must be in some way transmitted from generation to generation and this transmitting process, by whatever agencies it may be conducted, is the educational process that has gone on since the dawn of history.

What is vocational education?—If the conception of education just suggested but not specifically embodied in words be accepted, then vocational education becomes that part of the experiences of any individual whereby he learns successfully to carry on any gainful occupation. This is the broad sense in which the word is used in this book.

The narrower use of the term—In addition to the broad definition of vocational education just given, it must be recognized that it is also used in a narrower sense in which it implies the existence of a series of controlled and organized experiences used to train any person or persons for any given employment.

A boy gets a job in a plumbing shop. He cubs around with the journeymen. He has some opportunities to observe the practice of the trade. He has some opportunity to ask questions which may or may not be answered by the journeymen. He may possibly make some use of books with which he struggles as best he can. He may have some little chance to use tools and acquire some manipulative ability. He may get some accidental contacts with the literature of the trade. Under such conditions

whatever skill he acquires he gets mainly by imitation. Whatever general information he receives is haphazard. If this kind of experience goes on long enough and if the boy has sufficient intelligence, he will ultimately secure a fair command of the trade as a journeyman. This is the way that most men acquire a trade, and is what may be called unorganized vocational training. It might in most cases at least be described as chance or haphazard vocational training.

On the other hand, let us suppose that this same boy has been given an opportunity to secure through organized instruction as an apprentice, the technical content of the trade; that he has been given an opportunity to learn the practice of the trade under the skilled direction of competent plumbers; that, in short, he has been assisted in all the various ways by which competent instructors can assist a learner. Three things will be sure to result: First, he will be a better plumber because he will know more of the theory of his trade and he will be a better worker because he has learned standard practices from first-class men. Second, he will have progressed much more rapidly and with much less discouragement and wasted effort. Third, the boy who is potentially a first-class plumber will in most cases be saved to the trade, whereas under haphazard methods, he would be driven out by discouragement and difficulties. This systematic controlled use of the experiences in any occupations for training workers may be called organized vocational training.

The term vocational education as used in the broader sense here covers both unorganized and organized methods of securing occupational confidence and proficiency. The narrower or technical use of the term will apply only to the second type or method of training.

Vocational education nothing new—Ever since the human race began its long struggle to conquer its environment, manual skill and job knowledge have, in one way or another, been transmitted from man to man and from generation to generation.

Every time a new discovery added to the assets of the human race, there arose the necessity for diffusing this knowledge in some way and for transmitting the necessary special manipulative skill to put it into practice. Even what might be called the usual or customary occupations and processes of primitive men had in some way to be acquired by new recruits and these same occupations and processes had in some way previously to be acquired by those who preceded these novices.

Vocational education and the social recruit—It is probably true that all the phenomena of vocational training in modern society have their roots in the past. In a sense at least we are not dealing with anything new, but only with expansions and developments of what has always existed. Youth has always been regarded as an asset to the social group by family, tribe or state. Primarily he was a defensive and hunting asset so that probably the first vocational training objective was in the use of arms for combat and for providing food. The safety of the group being so vital, it is also probable that this kind of training was the first to take conscious and organized form. Training in the use of arms is probably one of the oldest activities of the teaching profession.

Next in importance from the standpoint of social survival and progress was the value of youth as an immediate and a prospective labor asset; hence the problem of giving what we would now call vocational education to social recruits. This also appears early in human history.

Vocational education in the family—This primitive vocational training appears to have taken one of two forms. It was either acquired by the youth in the family, or was acquired through observation and practice from the more mature members of the social group. On the whole the training he secured for what we would now call production jobs, such as the care of animals and the tilling of the soil, was secured within the family circle. What he secured in the practice of arms was probably gained from the better warriors of the community.

In the primitive stage of human development there was probably nothing but work, and all jobs were "work jobs." It is fair to assume that certain individuals showed some pre-eminence in this or that special line of work. Often some one would discover a new way to do an old thing or an entirely new thing. In either case, the tendency would naturally be to assign certain youth to the more expert individual so that they could obtain from him, probably largely by imitation, the special knowledge and skill which he possessed. This is, in essence, the helper system.

Bartering ability for teaching—If human nature was the same in those days as it is today, the man who possessed special proficiency by virtue of discovery or special aptitude or long experience would regard that proficiency as a special personal asset. He would make it the basis of barter and trade, both for his services as a producer and as a teacher for imparting what he knew and could do. In short he would establish a monopoly. He was probably left in the enjoyment of his monopoly until it became recognized that the knowledge which he possessed was so vital to the common good as to require its use by others as well.

The development of the idea of organized vocational training—As time went on it gradually appeared that the individual who wished to learn could be handled by methods and devices more effective than mere observation or imitation or incidental participation. By the organization of training experience under competent instructors conscious of their responsibilities, the process of transmission was rendered more rapid and more effective, a stage in vocational education which is still in progress of development at the present time.

The present stage of development of vocational education—We still have and probably always will have, in modern Society, all the forms or kinds of vocational education just described. Most farmer boys still learn farming in a more or less haphazard way from their fathers. At the same time, agricultural schools and colleges are making rapid progress in the systematic teaching

of agriculture to increasing numbers. Most girls still learn the duties of housekeeping from their mothers, but organized instruction in home economics has become a recognized part of many school curricula. Most workers in industry still learn their jobs by the "pick up" method where observation, imitation and individual initiative are the only means of training. But here, too, increasing opportunities for securing organized training are now being offered by employers, by schools, by workers themselves and by cooperation between these agencies.

The generally accepted principle that only a person who is himself competent in an occupation can give effective vocational instruction for that occupation is the modern recognition of the value of the specialist in transmitting knowledge and skill. Today, as always, every new discovery of science or new invention of recognized value finds its way into general practice in every field through instruction given to others by the original discoverer and his followers. Only in this way does it become a permanent addition to the sum of human knowledge.

The large part played by unconscious training—Reference has already been made in this chapter to organized and unorganized training. When we study the various ways in which people learn how to do things, we find, in general, two attitudes or states of mind on the part of the learner and two ways by which the learning process is conducted. The learner may be either conscious or unconscious of the fact that he is learning. This may be true whether the learning experiences are organized or unorganized, though it occurs more commonly under the latter condition.

This unconscious training plays a much larger part in vocational education than is commonly realized. In fact, this is true of all forms of education. We learn much by imitation, by casual observation and perhaps still more by unconscious absorption. This fact is common knowledge to us all. It is the way in which we acquire table manners; it is the way in which most

of us gain what we know of social etiquette; it is the way in which most of us, especially men, have learned to cook or to sew on buttons; it is the way in which children obtain most of what they get from their elders or from other children.

Under all these conditions the individual, whether adult or child, is usually entirely unconscious of the fact that he is going through any sort of a learning process, that he is "learning anything." Not only is he unconscious of this fact, but in most cases the "instructor" is equally unconscious that he is teaching anything. In technical language the relation of instructor and learner is consciously recognized by neither party.

On the other hand, we do learn much as we go through life where the relation of the instructor and learner is recognized. When a child goes to school he understands that he is there to learn from the teacher, and the teacher recognizes a responsibility for giving instruction. This is not confined to the schools, however, but is equally true wherever some one individual who knows something or can do something is called upon to transmit what he knows to a group wanting it. When a well-known financier addresses some social club such as a Rotary or Kiwanis Club, on some phase of finance concerning which the members wish to be informed and on which he is a recognized authority, we have the relation of conscious instructor and conscious learner set up just as much as in the school room.

Conscious vocational education defined—Conscious vocational education, then, may be defined as the transmission of knowledge or skill under conditions where, on the one hand, the function of the instructor is recognized, and, on the other hand, the need of the group for instruction is recognized. The man who feels the need for certain training and avails himself of the use of a library in which writers of books become his teachers, is carrying on an educational process of which he is perfectly conscious. On the other hand, the man who writes such a book is equally conscious of the fact that he is endeavoring to place at the disposal

of his readers something in which he is presumably a specialist. The school, after all, merely becomes a place where the work of the teacher and learner can be carried on more effectively.

Unconscious vocational education unorganized—It seems obvious that all unconscious vocational education is generally unorganized in the sense that it is not controlled, and therefore operates largely by chance. Yet this educational process may be said to be organized to the extent that it is controlled as to the factors which make for efficiency. It may be said to be unorganized to the extent to which the control does not extend to all these factors.

If the aim, for example, is clearly defined and understood—that is, if the instructor knows exactly what knowledge and skill it is his job to impart—to that extent the instructing process is organized. If ineffective methods of teaching a good course are used, to that extent the instructing process is unorganized. If the progress of the learner is so planned that he goes from step to step in the easiest way, to that extent the training may be said to be organized. If the teaching devices, though good, are not adapted to the characteristics of the group to be taught, as when methods found successful only with children are imposed on adults, the training is, to that extent at least, poorly organized.

It is indeed quite possible to have a training course highly organized on the mechanical or administrative side and yet very poorly organized with regard to other efficiency factors, such as the recognition of group characteristics, very clearly defined aims, and the use of the most effective teaching devices. It is equally true that a poor mechanical organization, although accompanied by a very good organization from the standpoint of these other factors, may reduce the efficiency of the whole training program. It is conceivable that an educational scheme might be sound and well planned on what might be called the strictly pedagogical side and yet fail because of its lack of well-organized machinery.

Public vs. plant vocational education—In general, public school attempts to give vocational education always tend to be strong in their organization of administrative details. At the same time they are likely to be indefinite and uncertain as to the primary or dominating aim of the work. They often fail to recognize and adapt their procedure to the interests and aptitudes of wage-earners. On the formal side of teaching their methods are superior to those found in industry, but their greatest weakness is their failure to secure and use real or participating experiences as subject matter for training.

On the other hand, the training given by the shop or office is likely to be poorly organized in its administrative detail. The aims of the work are usually very definite and direct. Much attention is given to ways by which to adapt the work to the real needs and to what might be called the occupational psychology of the learner. While the teaching methods suffer in many respects when compared with those of the public school, they are at least applied to practical instruction in the occupation taught.

Few vocational schemes are well organized as to all efficiency factors. Formal schools are better on administrative machinery and pedagogical methods, while plant schools are better on directness of aim, recognition of group characteristics, and the use of real experiences as a teaching device.

While it is apparent that all unconscious education is totally unorganized, it is equally clear that all conscious education as above described may be either organized or unorganized and that the degree to which any training scheme may be regarded as organized depends upon the extent to which it has effectively put into operation all recognized factors in successful instruction.

Steps in the development of vocational education—As civilization has developed, the steady tendency has been to increase the educational area covered by conscious, and more or less organized, instruction. This has been true of our general schools and has been equally true in the development of vocational educa-

tion. In general terms, it may be said that the whole problem of education has gone through the following steps: individual initiative and ingenuity; unconscious absorption and imitation; conscious imitation in the home; unorganized training in the home; organized training in the home; division between home and the occupation; conscious and organized training through apprenticeship; "pick up" learning under specialization; and organized training through such devices as apprenticeship, the foreman instructor and the public and private school. These steps are very well illustrated by the history of vocational training summarized below.

Doubtless before the family stage of human history, man learned to fish and hunt by his own efforts. His success was the measure of his ability to survive. When men began to live together, each profited in the struggle for existence by watching the efforts of others in fishing or in hunting or in fighting. When the home was organized, the daughter learned to weave by imitating the work of her mother. When the home began to realize the importance of child labor, the son was taught in an unorganized way the crude art of agriculture by his father, while the mother in a casual way taught the daughter the rudiments of the arts of cooking and sewing. As the youth became recognized as a potential rather than an immediate asset of the family, this home training, at least in the more intelligent homes, became more conscious and better organized.

When division of labor took the family arts from the home and developed specialists in different services such as flint making, arrow making, or pottery and similar activities necessary to the welfare of the home and the tribe, the tendency was to send the youth from the home to these specialists for training. As the crafts of these specialists developed, it became necessary for them to train new recruits for service. In the later centuries these specialists organized themselves into guilds and established a system of apprenticeship under which for the first time in history a scheme of consciously organized instruction in the crafts

was put into effect. Large scale production and the specialization of tasks brought in its wake the decay and final overthrow of this ancient apprenticeship. There followed a long period during which the individual who desired to learn a trade must learn it the best he could without the aid of any form of conscious or organized training. This is commonly called the period of the "pick up method." With the limited production of one hundred years ago, the pick up method, while unquestionably inefficient and expensive, served fairly well to meet the situation.

Modern conditions require more efficient vocational training—The tremendous expansion of production and the keener competition of modern business require the more rapid and the more effective training of much larger numbers of people. In the face of this demand, the ineffectiveness and inadequacy of the pick up method of training new workers have gradually become apparent. The contributions of science and invention have not only made this tremendous production possible, but in its accomplishment have called increasingly for the systematic training of technicians and leaders. The progress of science and invention has not only resulted in an increased demand for the technician and inventor, but has also created great numbers of new jobs and profoundly modified the processes in many old jobs. Within the last twenty years the plumbing trade has changed from an essentially manipulative trade to a technical trade. The same might be said of printing since the introduction of the linotype and the monotype, and of baking since the introduction of scientific control of bake shop materials and processes. While the methods used in the shaping of metal by cutting or abrasion were entirely different fifty years ago from those used today, weaving so far as its operations go has remained the same since history began, but operations once performed manually are now largely performed mechanically. In fact, the modern automatic stop loom performs mechanically all but one of the operations that were originally performed entirely by hand.

On the whole, the easiest part of the content of any industrial

occupation to secure through pick up and practice is manipulative skill. In proportion as the weight of content has shifted from a demand for manipulative skill to a demand for the possession of technical knowledge and the ability to apply that knowledge intelligently on the job, it has become correspondingly necessary to equip the learner through some sort of organized training. The realization of this fact has led to a renewed interest in vocational education and to the various steps which have been taken to make it more systematic, in order that it may be more efficient.

This increased interest has shown itself not only through the establishment of vocational schools under public control, but even in a more pronounced degree through such private efforts as the revival of apprenticeship; the attempt to restore the foreman to his ancient place as an instructor of his men; and the establishment of correspondence schools, privately endowed schools and corporation schools.

All of the stages of development described in the early part of this chapter can be seen in operation today. This is obvious to anyone who has given even slight attention to the subject. Through the entire field of vocational education, however, is operating a steady tendency to substitute organized and conscious training for unorganized training and unconscious learning.

Vocational education a social efficiency device—As will be discussed at some detail in a later chapter, social wealth furnishes the opportunity for society to maintain stability and progress. The greater the degree to which social wealth can be produced in the most efficient way, the greater our potential resources for achieving our ends as a nation. On the whole, organized vocational training is an efficiency device. It undertakes to do nothing which has not been done before; it merely undertakes to discharge the same function more efficiently. It can therefore be regarded as one of the agencies whereby the State can more efficiently secure social wealth. The trend toward more syste-

matic training noted above is nothing more than the crude realization that this fact is true. It therefore follows that in proportion as we are able to substitute organized vocational education for unorganized vocational education, social progress will be furthered, more social wealth will be produced at less cost, and society will be better equipped to carry on its struggle against nature and to carry out its hopes and its aims.

QUESTIONS AND POINTS FOR DISCUSSION

1. Is the ordinary way by which a boy acquires a knowledge of "radio" a case of conscious or unconscious vocational education? Why? Does he have any teacher? If so, whom?
2. Make a list of non-school agencies that may be considered as functioning in conscious vocational training.
Make a list of corresponding agencies that function in civic training.
3. List a series of cases in the history of primitive man where an expert in some one line was maintained as a teacher by the community.
4. Make a list of a number of jobs where formerly the operations were entirely or largely performed manually, and are now entirely or largely performed mechanically.
5. Is a correspondence course a case of organized or unorganized vocational training? Is it a case of conscious or unconscious training? Why?
6. How would you classify the following cases:
 - a. Learning how to find the way about one's home town in the way a boy does as he grows up.
 - b. Learning to walk.
 - c. Children learning how to handle a "scooter."
 - d. Taking a course in stenography in a business college.
 - e. Learning to operate an automobile.
7. Make a list of the characteristics of organized and of unorganized training.
8. Compare, with regard to the points raised in this chapter, a course of training given by a commercial or industrial organization with one given in a vocational school under public control.
9. Select some one trade or occupation with which you are familiar and trace the successive steps in the development of vocational training for it.

BIBLIOGRAPHY

The Long Journey. Johannes V. Jenson. Alfred A. Knopf, New York.

Before Adam. Jack London. Grosset and Dunlap, New York.

The Story of Ab. Stanley Waterloo. Way and Williams, Chicago.

These three books all undertake to deal in some way with the conditions under which primitive man struggled with the elements and with himself. They are, of course, imaginative. *The Long Journey* is an allegorical tale of the development of mankind, his slow discovery of such inventions as the use of fire and the rise of some sort of social order. The book is in three volumes. Volume I is the most important from the standpoint of the discussions in this chapter. All are interesting. The other two books have for their background more of the social and physical conditions under which primitive man had to work out his problems. They give in a popular way a very clear notion of things as they existed in the prehistoric period of man's progression.

Rewards and Fairies. The Knife and the Naked Chalk. Rudyard Kipling. Doubleday, Page & Company, New York.

This story and poem deals with the conditions among primitive man in his struggle against the wolves and the way in which the iron knife was secured to fight them with. It gives a picture of what it meant to mankind to be able to use iron weapons in place of flint.

Window in Thrums. J. M. Barrie. Charles Scribner's Sons, New York.

While a novel in its form, this book does give, through its background, a very excellent idea of the conditions in a Scotch community of weavers before the development of the factory system of production.

Vocational Education: Its Theory. David Snedden. (Part I of *Vocational Education*. Snedden, Weeks and Cubberly.) Houghton, Mifflin Company, Boston.

A general discussion of vocational education and its relation to other forms of education. Has considerable bearing on the conceptions of education and of vocational education set up in this chapter.

Talks to Teachers on Psychology. William James.

Valuable in connection with this chapter on account of the broad conception of education set forth in these talks. "The measure of education is the degree to which the individual is able to deal successfully with his problems."

A History of Inventions, Discoveries and Origins. (Fourth edition.) John Beckman. George Bell and Sons, London.

This book describes the origins and gives the history of a great many inventions such as corn mills, the saw, the odometer, wall paper, etc.

The Origins of Invention. Otis T. Mason. Walter Scott, Ltd., London. (Contemporary Science Series.)

This book gives the history of the discovery and development of such inventions as tools and mechanical devices, the uses of fire, pottery, and textiles, the domestication of animals, and the art of war.

The School and Society. John Dewey. University of Chicago Press, Chicago.

Deals with the conception of education as a social agent and develops certain ideas advanced in the text of this chapter. An educational classic.

Educational Aims and Educational Values. Paul Hanus. The Macmillan Company, New York.

Developed around the thesis that education is preparation for life.

Two Years Before the Mast. Richard Henry Dana.

A classic in the history of the old American merchant marine. Interesting here because it gives a very good idea as to the pick up method of training used on ships in those days.

The New Industrial Day. William C. Redfield. The Century Co., New York.

This book includes a discussion of vocational education as a social efficiency device and, from this angle, is of value in connection with this chapter.

How to Make a Curriculum. J. Franklin Bobbitt. Houghton, Mifflin Company, Boston.

This will be of interest to the reader because it deals so clearly with what is not vocational education.

Proceedings of the Fourth Annual Meeting, National Society for Vocational Education, Boston, 1911. Trade Education for Girls. N. S. No. 13, Part I.

Gives a very good idea as to the thinking on this subject at that time. Part II deals in the same way with apprenticeship and corporation schools.

Part III deals with part-time and evening schools.

This bulletin is, in the main, of interest only historically.

Part IV. The social significance of industrial education.

Proceedings Third Annual Meeting. Milwaukee, N. S. No. 10.

Valuable historically as showing the condition of the development of vocational education at that time.

Proceedings Second Annual Meeting. Atlanta, Ga. N. S. No. 9.

Chiefly of historical value.

Proceedings of First Annual Meeting, Chicago, 1908. Part 1,

N. S. Bulletin No. 5; Part 2, N. S. Bulletin No. 6.

Chiefly of historical value.

Proceedings of the Joint Convention of the National Society for Vocational Education and the Vocational Education Society of the Middle West. Chicago, 1920. N. S. Bulletin No. 32.

The various subjects considered by the speakers indicate very clearly the development of thought in the various fields of vocational education, up to the date of the publication. The discussions include agricultural, commercial and industrial education, and the future possibilities of National and State administration.

CHAPTER II

THE ECONOMIC THEORY OF VOCATIONAL EDUCATION

Education, not force, the reliance of democracy—Education, not force, must be relied upon to secure stability and progress in a democracy. In the preceding chapter it was pointed out that this stability and progress depend upon the production of wealth through the conservation of natural and human resources. All education contributes to this conservation. Since education, however, must be adapted and differentiated to meet a wide diversity of human needs and human problems, it must take many forms, each contributing in a special way to the general objective. It remains to consider vocational education as a special form of education in its relations to the development of the material and human assets of a people, and hence in its relation to the well being of a democracy.

Vocational education and the democratic progress—Vocational education functions in any forward looking program of a democracy in at least two ways. First, it conserves natural resources; second, it conserves human resources. It conserves material resources by promoting, disseminating and transmitting skill, knowledge and the results of invention, and by conserving human effort. It conserves human resources, not only by conserving human effort, but by promoting morale and intelligence. This chapter deals with the relation of training to the conserving of material resources.

The self-contained country—Wealth is created by making the most of natural resources whether these be native to a country or imported. If we can imagine a country having no means of

importing, or no need of importing such natural resources, we might speak of it as "self-contained."

In such a self-contained country the amount of wealth produced would depend upon the value of the products created from its own natural resources, in terms of market demand. In general, the value of such products depends upon the amount of skill which has been applied in turning them out and upon the efficiency of the operations and processes that have been used.

In such a self-contained country as we have imagined, the kind and amount of natural resources would be fixed, but the amount of skill and technical knowledge which might be used in creating products would be limited only by the possibilities of human invention and the extent to which skill could be developed, and efficiently utilized. This last possibility is practically unlimited. We can set no bounds upon the possibilities of invention, or upon the discoveries of science, or upon the applications of technical knowledge, or upon the limits of human skill. Such a self-contained country would therefore gain in wealth in proportion as these limitless factors were developed and applied.

No country self-contained—As a matter of fact no country is self-contained today. The development of cheap methods of transportation has made it possible for any region to draw upon the natural resources of any other region. England could not exist today if it did not draw largely upon the natural resources of other countries. Its textile industries have assumed huge proportions in a land unable to raise a single pound of cotton or silk. This necessity to draw upon the resources of other regions is even more true of the New England States.

The fact that any state or nation is in competition with more favored countries makes necessary the development of higher grades of skill, and of higher grades of technical knowledge to offset the handicap. It might also be said in passing that this fact is one of the important arguments taken into consideration by the Douglas Commission on Industrial Educa-

tion for Massachusetts and will be found set forth in considerable detail in the report of that body. It was this document that resulted in a strong vocational program for that commonwealth.

Discovery and invention fundamental—If the wealth of any country depends upon what it is able to do with native or imported raw material and if progress and stability depend upon the degree to which wealth is produced, then any country is vitally concerned with the means by which skill is developed, technical knowledge is obtained and applied, and science and invention are promoted.

Of course the fundamental basis on which the character of skill is determined and technical knowledge is secured, is the development of science and invention. In this respect a democracy has a large advantage over countries with a more repressive form of government, for it stimulates the effort and offers the freedom of initiative which results in more fundamental discoveries by scientists and more ingenious devices by inventors.

Developing machines and processes—Every form of society is not only interested in the promotion of scientific discovery and invention as a means of producing more wealth from natural resources, but it is also interested in the efficiency with which these natural resources are converted into marketable products. The whole struggle to gain the maximum utilization of natural resources—a struggle which has been repeated again and again—passes through three stages. Somebody makes a discovery in the field of science or invents a new mechanical appliance. The first case might be illustrated by the chemical discoveries regarding the preparation of aniline dyes from coal tar. The second might be illustrated by the linotype.

The fundamental discovery having been made, or the new machine having been invented, the problem becomes one of working out processes, or of developing the machine so that products may be turned out with the highest degree of efficiency;

that is, at the minimum expenditure of time, energy and money, and with the largest corresponding amount of output. All through this second stage, however, as the machine is improved or the processes are more fully worked out, there is need for the development of the skill necessary to operate the new machine or to control the new operations and processes.

Following this second stage, there comes what may be called a third stage. In this there is a need for securing from those who have learned how to do the new job an accurate inventory of the technical knowledge required by the operator, of the machine or the controller of the new process. This constitutes what may be called the content of that special production job.

Necessity to develop discovery, machine skill and knowledge—If we stop with the discovery itself or with the original invention, it either dies young or we fall far short of securing from our natural resources all the wealth which can be produced. If we fail to determine just what kind and degree of skill are necessary to operate the new machine or carry on the new processes as they are developed, we fail again to secure from our natural products all the wealth which can be produced. It is equally true that if we fail at all stages in the development of the machine or process to determine exactly the technical knowledge required, we also fail to secure from our natural product all that we could get.

The process dynamic, not static—It was a fundamental discovery by Farraday that a wire cutting through lines of magnetic force induces within itself an electric current. During a period of nearly a hundred years this fundamental discovery, through a series of minor inventions, has progressively developed the electric generator. In its present form this machine represents hundreds of inventive contributions evidenced by hundreds of minor patents. Ever since one of the first working electric generators was installed to feed an extremely inefficient electric light in a light house on the English channel, there has been required

to operate this machine a certain kind of skill and a certain body of technical knowledge, which must be possessed by the operator.

As improvements have changed the construction and design of the dynamo, the character of the skill required has also changed, and the technical knowledge which the operator must possess has changed correspondingly. From the first to the last stages in the development of this practical application of the Farraday discovery, there had to be carried on a continual training process whereby there was imparted to those in charge the necessary skill and the functioning technical knowledge required to make the machine of service.

This same story might be told with regard to thousands of mechanical appliances and operations and of other thousands of chemical operations and processes. All of them originated in the discovery of a very simple physical or chemical fact, and all of them have, through a long period of development, been brought up to their present stage of efficiency through all the stages of this development.

The corresponding flux in skill and knowledge—Few people realize the extent to which the progress of science and invention is resulting in the development of new technical knowledge and the replacement of old kinds of skill by new. To a certain extent most of us in our thinking with regard to this matter are still living in the past. In the days of apprenticeship under the guild, the operations and processes, as well as the tools and mechanical appliances used, remained practically the same. Under these conditions the master workers could impart to the apprentice the technical knowledge and skill required in a leisurely, and, on the whole, in a very satisfactory manner, because this knowledge and skill were not only very simple but were for the most part uniform and fixed.

We are very apt to think, subconsciously perhaps, that this condition still exists, and conclude that the same methods of training will give equally satisfactory results. Nothing could

be farther from the truth. Under modern conditions the whole matter of production has become subject to the same flux which characterizes the social life of a democracy. New skills are continually required to meet the operating condition of new machines. New scientific discoveries involve the acquisition of new technical knowledge. Old skills are continually being discarded; old technical knowledge no longer serving its purpose must be replaced by new. The linotype operator and the hand compositor have little in common in their skill and technical knowledge; the monotype caster has virtually nothing in common with either the compositor or the linotype operator; while the multigrapher has little to do with any of the others. In terms of knowledge and skill what is there in common between the operator of an old Franklin press and the pressman on a modern speed newspaper press?

Recently, a great printing establishment was established for the purpose of transforming trees into books by the use of specially devised mechanical appliances, most of which were imported for the purpose. Because the processes and the machines were so different and the technical knowledge required was so new, the company found it advisable to make its operators out of "green hands" rather than to utilize any operators having previous experience in the printing business as commonly conducted at the present time.

Adaptation and readaptation of the worker—The sweeping change in the demands of modern production has brought with it the need on the part of the worker for both quicker adaptation to a job or process and for what might be called constant readaptation to the demands of new jobs. Slow methods of training must give place to rapid training. With the call for rapid adaptation and for continuous readaptation and with the large scale production which makes the efficiency of the worker much more vital than under more simple conditions, the pick up method, even for the ordinary workman, no longer meets the situation.

More and more this method must be supplanted by better organized and more systematic ways of conferring both skill and knowledge. What has been said applies especially to industrial activities, but better methods of conferring skill and knowledge are none the less essential in agricultural pursuits, in commercial occupations and in the occupations of women in the home.

This book is being written in the trade center of the Northwestern States, a community keenly alive to the sweeping changes which have taken place in agricultural conditions. The production of wheat on a huge scale has ceased to be profitable for the farmer of this region. At this present writing a desperate united attempt is being made by the press, the agricultural colleges, the secondary schools of agriculture and farmers' associations and cooperative groups almost without number, to have the farmers of the region depart from the traditional unit crop of wheat and substitute diversified farming. This means for them the acquisition of new technical knowledge and new skills. Consequently, new courses of training are being organized and the newspapers of the region are full of new kinds of information which the farmer needs in adapting his farm and his methods to the new program.

Professions abandon pick up training but the trades have not—In the professional field the advance from unorganized or pick up training to organized instruction has already reached a considerable stage of development. The law school and the medical school are now substituting organized training for the unorganized training previously secured by the youth in a haphazard way from the old doctor or the old lawyer. Not only is this true, but these professional schools are continually changing their subjects and their subject matter in order to give their students the results of the latest experiments and research. Unfortunately, however, this trend toward a substitution of systematic for haphazard vocational training has made itself evident almost entirely in the universities and engineering schools. Without intending

in any way to discredit what has been done in the development of training of less than college grade for industry, agriculture, commerce and the home, it must be admitted that the showing, in comparison with the size of the problem, is far less than in the field of professional education.

Great mass of workers still trained by pick up methods—It may be fairly said that in the professional field the pick up method has been practically abolished, while it still remains the vocational training device for the great mass of workers. This difference cannot altogether be accounted for by the fact that in such professions as law and medicine and teaching legal standards have been set up which the practitioner must meet in order to qualify and by the fact that these standards are of such a nature as to require organized training in order to reach them efficiently. The difference is probably much more due to the fact that the professions have traditionally been held to be of pre-eminent importance. Consequently, special effort and organization have been deemed necessary in training for them. Even beyond all this lies the fact that the professions have always been looked upon, at least in recent years, as “respectable” and therefore worthy of the best forms of training at public or private expense, while the work of actual production, whether in agriculture, or in industry, or in any other field, has been regarded as less “respectable” and therefore not regarded as worthy of equal encouragement and help.

Licensing occupations promotes organized training—It is rather significant here to note that in some places in this country license requirements have been established for plumbers, electricians and for steam engineers. The licensing of the plumber has come because of the realization that he has become a sanitary agent whose work affects public health, and the licensing of the electrician because he performs a service that affects the safety of property. The same is true of the steam engineer. The setting up of license requirements for tradesmen has almost inev-

itably been followed by schemes of organized training in order to fit the applicant more effectively and more rapidly to meet the requirements of the licensing examination and therefore of the job. The license or certification required from the tradesmen in these lines, however, was established not for promoting the trade or training for the trade but solely as a public welfare measure.

Pick up method kills old apprenticeship—There have been many reasons assigned for the decay of apprenticeship in modern times and all of them have a degree of truth. In the face of the constantly changing demands of the so-called trades, apprenticeship can be said with safety to have fallen into neglect and disuse because it gave long and slow, instead of rapid, training when the latter was demanded to meet rapidly shifting requirements. Apprenticeship relied upon old time static skill rather than upon training in new skills and new knowledge as needed. Lacking organization for training purposes, it used the pick up method when the need for some form of training was recognized. As the trade shifted from a manual to a technical occupation, no means was provided for securing the technical knowledge required. Finally, whatever instruction was given, if such it might be called, was always given by older tradesmen, many of whom, at least, were unable to convert their old knowledge, or adapt it to new needs.

Making skill and knowledge available rapidly—The old apprenticeship plan was probably on the whole well suited to the conditions of a simple society in which the assets of a worker were handed down from one generation to another, man to man. It failed utterly to meet the conditions of modern life where the problem has become largely that of starting and spreading knowledge and skill constantly arising from the progress of discovery and invention.

This imperative need for the rapid diffusion of new skill, new knowledge and new job intelligence which confronts society in

our day is due to a number of causes: First of all, the large numbers of persons employed in every line, as contrasted with the isolated craftsman of a simpler society, make necessary the spread of any new invention or process over a great group of workers. The wide areas in which these workers are employed again presents the problem of wide distribution. The constantly growing body of information and the resulting shift in tools and machines and processes going on in every industry create corresponding needs for help on the part of literally millions of producers. Finally, our modern means of rapid communications makes it possible for us to diffuse this help effectively. It requires only organized vocational education to insure that this assistance is given in a systematic way whenever and wherever it may be needed.

Somebody discovers the absolute proof that the black rust which has been such a prolific source of loss in the wheat crop is due to the presence of the Barberry bush where the insect which produces the rust lives. It would probably have taken all of the fourteenth century for this information to have found its way sufficiently throughout Europe to cut down materially the loss from this blight. Within twenty-four hours after this proof was discovered, it was known to the leaders in agriculture in every state in the Union, and it was necessary that it should be so rapidly known. Consequently, within the short space of three months definite steps had been taken in every wheat-growing state in the Union to combat the evil by a war upon the Barberry bush.

The same might be said of the discovery of ways in which to control the boll weevil and of the use of certain sprays with which to destroy the potato bug or the elm leaf beetle. A failure to give rapid transmission to such information would have meant a very large loss of potential social wealth, with resulting economic distress as well. The rapid diffusion did result in increased social wealth and hence in an increased opportunity

for social progress. Whatever are the devices employed for the purpose of making the needed information or skill available for use, they constitute vocational education in the sense in which the term is here used.

Vocational education in a new world—The following chart gives a summary of the sweeping changes that have taken place in the conditions of production, in the nature of occupations, in the demand upon workers that they possess increased skill and knowledge, and in the training policies and methods required to meet these demands. Inasmuch as many of the items presented in the chart will be considered in subsequent chapters, they need no further discussion here.

TABLE No. 1

CHANGING CONDITIONS AND PROBLEMS IN VOCATIONAL EDUCATION

Item	In the Past	Now
1 Fundamental basis of skill and knowledge	Tradition and custom	The development of science and invention
2 Kind of occupations	General and standardized	Special and diversified
3 Number of occupations	Few	Many
4 Kind of tools and appliances	Simple and uniform	Complicated and diversified
5 Changes in tools and appliances	Few and slow	Many and frequent
6 Use of old skills	Retained and perpetuated	Discarded and replaced by new
7 Use of old technical knowledge	Preserved and revered	Abandoned and supplanted by results of new discoveries and inventions
8 Use of new skills	Seldom called for	Constantly required
9 Use of new technical knowledge	Infrequently or slowly discovered and applied	Constantly and rapidly developed and applied
10 Kind of skill and technical knowledge	Simple and static	Complex and rapidly changing
11 Changes in skill and knowledge	Few and slow	Many and rapid
12 Amount of skill and knowledge used	Little in variety and degree	Extensive in both

Item	In the Past	Now
13 Changes in occupations	Negligible	Many and frequent
14 Need for rapid transmitting of skill and knowledge	None	Continuous and often urgent
15 Methods of transmitting skill and knowledge	Man to man	Many—school only one
16 Need of adapting worker to job	Yes but only once	Yes—many times during his productive life
17 Need for readapting worker to job	Little or none	Yes, many times
18 Total number of workers	Small	Millions
19 Number of occupational groups	Few	Many
20 Diversity of groups	Little	Wide
21 Geographical distribution of workers	Over small areas	Over vast areas
22 Rapid means of communication	None	Many and efficient
23 Wide diffusion of skill and knowledge	No need or possibility	Greatest need and possibility
24 Old apprenticeship an effective device	Yes where used	No—except in a few lines
25 Reducing time required to train new workers	Opposed as unnecessary—inadvisable	Constant effort to do this
26 Use of pick up method of learning	Fairly successful in primitive society only	Failure under modern conditions
27 Manner of training	Leisurely	Quick
28 Need for organized training	Yes, but not realized except in old apprentice shop	Yes with increasing recognition
29 General trade training	Yes for the old trades	No for most occupations
30 Specialization of worker	None	Much
31 Training of workers once for all in youth	Sufficient	No for most occupations
32 Training of workers by small increments during life	No	Yes for most occupations
33 Kind of apprenticeship required	Old apprenticeship	A new apprenticeship needed
34 Shifting of workers from one occupation to another.	Little	Much
35 Trade or industrial analysis necessary	Not for simple standardized trades	Much needed to determine training needs
36 Occupational analysis necessary	No. Occupations in general standard trades	Many occupations—all requiring knowledge of training needs and job demands

Item	In the Past	Now
37 Training of youth necessary	Yes as adaptation for fixed trades	Yes as adaptation to constantly changing occupations
38 Training of adults necessary	No because readaptation rarely unnecessary	Yes, both for adaptation and readaptation
39 Training needed before employment	None	Some but no solution of mass problems
40 Use of the school for training	None	Increasing
41 Part time extension classes for youth	Not needed and unknown	Greatly needed and slowly coming
42 Evening School for readaptation of adults	Not needed and unknown	Greatly needed but sadly inadequate
43 Training given by occupation, or trade	Entirely	Very inadequately
44 Function of the school	None	To supplement the occupation as a training agency
45 What training best given by the school	None	Related technical knowledge and intelligence in its application

Opening the way for the non-com—Thus far the discussion has been directed to the problem of mass education—to the training of the ordinary workers in shop and office and home and on the farm—but all that has been said applies with even greater force as we go up the scale to the leaders of low and high degree in every economic activity. We have had altogether too much of a tendency to think of vocational education as simply training the direct producer.

We have not thought of the engineering college or the agriculture college as a vocational school, nor have we realized the extent to which leadership in production today is exercised by men who have come up, through the ranks of industry from journeymanhood or its equivalent, to positions of responsibility. Without engineering education and without organized occupational training, they have through sheer force of intrinsic intelligence and application gained, in spite of the pick up methods they had to use, a mastery of the processes and operations and information that functioned in their callings, as well as the ability

to organize and direct. The training process they went through was crude and cruel and wasteful, but they succeeded in spite of it! In their ranks are numbered today most of our great business captains, most managers and superintendents and almost all foremen. These men and women have the same need and the same right to organized assistance in their upward struggle to leadership as do the mass of workers for their tasks. As contrasted with the engineering graduate who may be styled the commissioned officer of industry, these constitute the non-commissioned officers in the production game.

We have provided well in this country for the engineering technician, but have almost completely neglected the training needs of most of the present and prospective officers of industry. Probably no other country in the world has recognized the economic and social value of this group so clearly as Germany or made such provision as she has through her Middle Technical School (*Mittel Teknikal Schule*) for their training. To the extent that systematic vocational education is developed in this country through a wide variety of day, part time and evening classes for novices, apprentices and journeymen, will the industrial leaders of America—most of whom will continue to come from the ranks—be better selected, better equipped, and therefore more effectively utilized to meet the rising demands and growing responsibilities of their callings. Nothing else will so promote economic efficiency in America. Finally, it should be said in passing that when the American technical high school now so common in our larger cities finds its real field of service, it will not be as a preparatory school for the engineering college—a service which that college does not regard as necessary since its entrance requirements still recognize and favor the old line high school. It will be as a finishing school preparing young men (and young women) for favorable entrance, as prospective non-commissioned officers, and possibly ultimately as executives, on the business and directive side of industry and commerce.

Opening the way for the inventor—No other country in the world has been so prolific in discoveries and inventions for increasing production and reducing costs as the United States. Applied to our rich natural resources they have been and will continue to be the chief factor in the creation of our social wealth, with its resulting opportunities for social progress. In his economic and probably in his social value, Thomas A. Edison is worth more than many thousands of ordinary citizens because of the use we have made of the many and varied labor saving, comfort making, and pleasure giving devices he has conceived and developed. Perhaps more than any other group we need to conserve the *discovering* scientist and the *functioning* inventor.

Any examination of the records of the patent office as well as current information show that most of the successful inventions are made not by technicians but by mechanics. A few of them have been more or less the results of accident and guess. The overwhelming number, however, have been produced by laborious study and patient experiment. Usually the inventor has brought to the task a rather high degree of native intelligence which he has trained into the habit of resourceful thinking about the special device or the process to be created. Usually, too, he is a man who has gained by practical experience some skill and understanding of ordinary mechanical processes. Usually, however, he lacks at the beginning of his work the special skills and the special technical knowledge necessary in solving his problem. As a result he muddles his way to a solution by the method of trial and error, or gains by his mistakes a grasp of the technical principles and mechanical laws by which he thinks his way through his difficulties, or learns from others in some way what he must know to make his device or his process work. Most frequently, however, he employs all three methods.

The social waste of haphazard invention—This haphazard method of learning to invent, if such it may be called, is socially wasteful even in the case of the inventor who is finally successful.

Most frequently he spends long years in misdirected and futile effort before he makes his one contribution. If he had been properly equipped with the functioning facts bearing on his problem, the periods of blundering experimentation would have been greatly shortened; the time saved could have been applied to the production of other inventions or the discovery of other practical processes of large social value.

On the other hand, these same Patent Office Records are cluttered up with thousands of ingenious devices which have been conceived by men of great inventive ability, but which are of no value to the world because they will not work successfully under commercial conditions, or because they have failed to take into consideration some vital principle or difficulty, or because they meet no real need. Had their authors been informed through previous or current help as to the real facts and theories involved, they would have been saved a tragic waste of hope and effort; many of their inventions would have been made valuable; and their undoubted ingenuity would have been utilized in the making of more and better contributions to economic efficiency.

These records of the Patent Office, however, do not tell the story of the thousands of would-be inventors who, in their attempts to invent things, have squandered their lives because of ignorance of certain mechanical or chemical principles and theories. A knowledge of these matters would have made clear to them the fact that their ideas were virtually impossible of accomplishment. Furthermore, these records furnish no information about still other thousands of more capable persons whose good ideas have never been finally embodied in any workable device or process because they became discouraged and disheartened over their lack of the necessary technical knowledge and skill and their lack of the opportunity to secure these in any effective way.

Vocational education and invention—If it were possible to establish a successful school or series of schools for the training

of inventors at public expense, the enterprise would probably be the wisest social investment that could be made, regardless of the cost. Admittedly, however, there is no such thing as direct training for the occupations of inventor—none of which we know at least. Like poets, inventors are born and not made. They possess, let us say, a certain native aptitude which creates successfully in proportion as this aptitude has been trained through experience in the special habit of resourceful thinking concerning the devices and processes of the field in which they are to be used and in proportion as this aptitude has been equipped in some way with the thinking stuff—the experiences, the skill and the pertinent information which are needed in the solution of the problems involved.

It seems clear that as organized vocational education in all its forms and stages comes to take the place of the old pick up methods of the past, this thinking stuff, if such it may be called, will be so widely diffused that every person having inventive tendencies and abilities will be exposed to an opportunity for getting what he now so sadly needs and too often needs in vain. This will be sure to result in uncovering and selecting, stimulating and equipping more and better inventors and lead to the creation of more and better devices and processes for the conservation of human effort in the production of social wealth.

Summary—Invention and discovery are continually creating new devices and new processes. These in turn make necessary for their development and efficient use, new tools, new appliances, new operations and new methods to which both workers and leaders must be continually adapted and readapted. This adaptation can be made only as new skills and new technical knowledge can be rapidly transmitted and diffused to great numbers of producers engaged in a wide variety of occupations and scattered over large geographical areas—a service for which the haphazard methods of the old pick up training have proved utterly inadequate. Organized systematic ways must be found properly to

equip the producers of America to meet the changing conditions and demands of their callings. All these ways are regarded in this book as constituting organized vocational education. In proportion as we do this, the contributions of the scientist and the inventor will be effectively used; higher grades of skill, job intelligence and technical knowledge will be developed; and the sum of human knowledge will be increased. As a result human effort will be used to better advantage; natural resources will be conserved; and the social wealth that can be used for desirable social ends will be increased.

QUESTIONS

1. Discuss the following thesis: "The effort of any nation to promote efficient vocational education is directly proportional to its lack of natural resources." How do you reconcile this statement with the fact that, at present, the Southern states are progressing as rapidly in the development of vocational education as the Northern states?
2. Give a series of cases where a nation lacking in natural resources has developed a large export trade in products representing the application of much skill and technical knowledge to a small amount of some raw material.
3. Make a list of at least six cases where important inventions were discovered by pure accident.
4. Do the same for six cases where the discovery or invention was worked out by the method of trial and error.
5. What arguments can be advanced *against* the statement that there can be no development of culture, or of art, or of any means for the æsthetic enjoyment of life if vocational training of some kind has not been in operation. Cite cases in support of this negative argument.
6. Does the promotion of productive ability promote human happiness? How?
7. Is it only to the advantage of a nation or state to develop programs of organized vocational education for the skilled trades alone? Is it only to the advantage of such a country to develop such programs in cases where it is competing with states or nations more favored as to natural resources of the same kind?

8. Would we expect to find programs for organized vocational education more completely developed in nations having large and varied natural resources or where the reverse conditions obtain? What factor not considered in this chapter comes in to complicate the situation as it actually exists at present?
9. Make a list of the factors, material and psychological, that do affect the attitude of a country towards organized vocational education.
10. Why is the American employer at the present time but little interested in the development of organized vocational education as a substitute for the pick up method? What change in conditions in this country is gradually forcing him to change his attitude about this matter? List the factors.
11. Which is the most important for the production of surplus wealth in a country, the training of leaders, technicians, non-commissioned officers of industry or workers? Why?
12. Give historical reasons why vocational training for the professions is generally held to be more "respectable" than vocational education for workers. Should these apply in this country today? Why?

BIBLIOGRAPHY

Social Control. Edward Ross. The Macmillan Company, New York.

A discussion of the various agencies on which society has depended for the maintenance of social stability, such as education, the Church, military control and the like.

Crowds. Gerald Stanley Lee. Doubleday, Page & Co., New York.

Discusses such matters as crowds and machines, letting the crowds be good, letting the crowd be beautiful, crowds and heroes and good news and hard work. A thought provoking book in connection with all forms of education in their relation to democracy. An interesting extension of the discussion in this text of the relation of education to the promoting of thinking and social progress.

Sociological Determination of Objectives in Education. David Snedden. J. B. Lippincott Company, Philadelphia.

A general discussion of education in its relation to modern society if it is to serve as an agent for social adjustment and of social control.

Does not deal especially with vocational education, but extends the thoughts of the text in a more or less technical way to all educational problems. Includes a discussion of such subjects as: The High School of Tomorrow. The Essentials of a Liberal Education Without Latin, The Junior High School, and the Social Objectives of Vocational Education.

The New Industrial Day. William C. Redfield. The Century Co., New York.

Suggestive in connection with this chapter on account of the discussion it gives of such subjects as: Wealth and Waste, The Days of the Rule of Thumb, Costs and Their Causes. Interesting also in connection with the discussion in the text, as to the change in requirements on occupational jobs.

The Worker and the State. Arthur Dean. The Century Co., New York.

A presentation of certain points of view as to the relation of vocational education to modern industry. Includes discussions of: The educational significance of modern industry, and the social and economic function of different types of schools.

The Human Factor in Education. James Phinny Munroe. The Macmillan Company, New York. (See also his *New Demands in Education.*)

Raises a number of questions as to the future of the United States that are related to vocational education as an agent that affects the answers. Bears only indirectly on the subject of this chapter, but is suggestive in connection with several subjects discussed therein.

Schools of Tomorrow. John and Evelyn Dewey. E. P. Dutton & Co., New York.

Only indirectly related to the subject of this chapter, but is suggestive in a number of ways. Includes discussions of such subjects as: Education a Natural Development, Freedom and the Individual, Education through Industry and Democracy and Education.

Education and Industry. Henry C. Link. The Macmillan Company, New York.

A discussion and description of the various ways in which industry is providing educational devices for its personnel. Bears only indirectly on the subject of this chapter but is suggestive as to a number of points raised in the text.

U. S. Census. Lists and classifications of gainful occupations.

These lists of gainful occupations give some idea of the great variety and diversity of jobs in modern society as compared with the much more limited range of employments in the pre-modern era. The numbers given are also interesting and suggestive in this same connection.

Report of the Commission on National Aid to Vocational Education. Part 1. Report of the Commission. Part 2. Hearings Before the Commission. Government Printing Office.

This report resulted in the passage of the National Vocational Education Act. It contains much discussion of the sociological and economic aspects of vocational education of less than college grade, both in the report itself and in the statements made at the hearings.

Report of the Commission on Technical and Industrial Education. Massachusetts, 1907. Public Document.

This is the so-called "Douglas Report." It is the report on which the original legislation establishing state aided vocational education of less than college grade was enacted. This legislation in Massachusetts antedated the passage of Federal legislation by several years. It gives both the social and economic arguments for this type of education in a state lacking natural resources.

This report is generally regarded as a "classic" in the history of the development of vocational education in the United States. At present it is almost impossible to secure copies, but many libraries contain them where they can be consulted by anyone who is interested. This report was also reprinted in a publication of Columbia University.

Report of the Commission on Industrial Education. Wisconsin, 1907.

This report was equally important, as initiating the legislation establishing a state program of vocational education in Wisconsin, and as giving the arguments as to its sociological and economic functions. Also difficult to obtain at the present time. Usually to be found in libraries. Not obtainable from the Wisconsin State Department of Vocational Education.

CHAPTER III

VOCATIONAL EDUCATION AND HUMAN RESOURCES

In the last chapter it was pointed out that vocational education conserves human resources in proportion as it conserves human effort and as it promotes the morale and intelligence of the worker. Since the relationship of this form of education to human effort has already been thoroughly discussed, it remains here to consider its value as a device for advancing morale and intelligence—two of the most important human resources on which this democracy must depend for its salvation.

Occupational intelligence—It is unnecessary to enter here into a long discussion as to what job or occupational intelligence is. It should suffice merely to remind the reader that the term as used here means the ability to apply such past experiences and acquired facts as bear upon the solution of problems connected with the job in hand, whatever that may be. Therefore, without further discussion, we pass to the question of the service of vocational education in this particular field.

All jobs require some intelligence—It has been commonly assumed by many that job intelligence is confined to the professional and skilled trades. It is true that the lawyer, the doctor or the craftsman probably needs to possess a comparatively high grade of native ability. The more occupations have been studied, however, the more it appears that practically every job requires a certain amount of what may be called job intelligence. Since any occupation may be regarded as nothing more than an aggregation of jobs, this statement holds equally true for occupations as a whole.

All jobs require the exercise of some human intelligence—So long as we have a partnership between the man and the machine, the man must supply the brain necessary to cover the human operating points on every job. Probably there is not at present and perhaps there will never be a case where all the operating points necessary to the continued operation of the machine and the turning out of a satisfactory product are solely mechanical. All jobs, therefore, require the exercise of some human intelligence or skill. The very fact that men are employed with the machine shows this to be true.

Inventions have increased demand for job intelligence—As inventions have multiplied, the swing from human to mechanical operating points has given man the ability to supervise more machines. This has not essentially relieved him of the demand for the continual exercise of some occupational intelligence. In fact the spread of human supervision over larger groups of machines usually calls for increased rather than decreased ability in the worker. He may need less manipulative skill because the machine does much or most of what was formerly done by hand, but he needs more ability for quick and resourceful thinking. This is equally true in the development of what might be called the intricacy of even the single machine. Here the increased quantity of material to be handled and the greater complexity of the machine to be manipulated or controlled call for the exercise of intelligence on the part of the worker as never before.

As an illustration of the spread of ability over many machines consider the increase in the number of power looms which can be successfully tended by one weaver as these machines have been made more automatic in their action. In the early days of the cotton mill, a good weaver could perhaps tend four looms. In the most modern mills, he can take care of as many as eighty. This, of course, results in a corresponding rise in production; has concentrated in the human side of the partnership those things which the machine cannot do; and obviously calls for greater intelli-

gence on the part of the weaver with a corresponding decreased demand upon his manual skill. Naturally the development of the machine in this case has changed the nature of the worker's duties; has spread his activities over a greater amount of production; and has required his service to be of somewhat higher grade.

A good illustration of the effect produced by the invention of an intricate single machine is the development of the linotype. This machine relieves the operator of many operating points which must be covered by the hand compositor and so enables him to focus his attention on all such important operating points as the control of operating, spacing, paragraphing and correct spelling. It also requires of the linotype operator the ability to concentrate and to use the machine intelligently under rapid working conditions, a demand that was not made of the old hand compositor.

As was described in a previous chapter, discovery and invention are continually changing the demands on workers; new skills are continually being created; and both these skills and the necessary functioning technical information must under modern conditions be rapidly diffused. This means not only the acquisition of new skills and of new technical information, but also the acquisition of new kinds of job and occupational intelligence. Just as in the case of knowledge and skill, vocational education of some kind is the only agency which can develop and transmit this job or occupational intelligence. In proportion as vocational education is organized, it can disseminate this intelligence with the minimum expenditure of time and energy.

Occupational intelligence in the Richard's formula—The relation of manual skill, technical knowledge and job or occupational intelligence has been indicated by the use of a simple "formula" which was first developed by Charles R. Richards, then director of Cooper Union. This "formula" is as follows:

$$E \propto M \text{ plus } T \text{ plus } I^1$$

This is simply the shorthand expression for the statement that efficiency on the job varies or depends upon the possession of the necessary manipulative skill, the possession of the necessary functioning technical knowledge and the possession of the intelligence which enables the individual to apply that technical knowledge to the problems of the job. Every foreman is familiar with the workman who is skilful with his hands and has absorbed in one way or another considerable technical information about his work, but who is unable to use his abilities in solving the problems or situations that arise on the job. The trouble is he lacks "job intelligence."

"I" is really that part of the job which the machine can never wholly meet, if indeed the machine can meet it at all. "I" is evidently important in proportion as the worker has the responsibility of making modifications in the job according to special conditions that may come up. It is one thing for a journeyman plumber to know that water exerts pressure in all directions and that this pressure varies according to the depth of water. It is quite another thing to apply this principle in the proper installation of a complicated water service system for a country residence.

Of course for different jobs and different occupations, "M," "T" and "I" have very widely varying values both as a whole and with regard to each other. For some jobs "M" is very large, while "T" and "I" are very small, as in the operating of an automatic screw machine. In others, "T" is very high and "M" is very low, as in the designing of a bridge. In still others, "I" is very high and "M" and "T" are almost reduced to zero as in the case of

¹ As given in bulletins of the Federal Board "I" indicates auxiliary and general vocational information as distinguished from the strictly technical information. As used in this book "T" includes all functioning information and "I" indicates intelligence in applying that information. The formula under the Board might, in order to correspond with that of the text, be made to read $E \propto M+T+I+J$, but "J" would represent the job judgment or intelligence represented in the formula given in the text by "I."

what have sometimes been called "judgment jobs," where a man is paid almost entirely for his judgment. This is true, for example, of the head miller in a flour mill and was true for a long time of those men who were paid solely for their judgment as to when a Bessemer converter should be poured.

Occupational intelligence most important—In the minds of many, the idea of vocational education has been tied up almost entirely with the thought of developing manual ability and the transmitting of general technical knowledge. No form of vocational education worthy of the name would confine itself to these two factors in the formula. This misconception has been due largely to the still wide acceptance of the theory of general intelligence, whereas what has been aimed at in vocational education has been, without disregarding the "M" and "T," to give also the special thinking intelligence, "I," which functions in the given occupation.

This kind or use of man's job intelligence is shown whenever a master of any occupation brings to bear all his knowledge to think his way through some difficulty that must be overcome. It has no better illustration than the rapid diagnosis of the real cause of engine trouble on an automobile made by an expert "trouble shooter"—a thinking skill which he has acquired and could only acquire by long experience in applying facts about gas engines to real gas engines. It is further to be regretted that this misconception has been accentuated by the fact that certain privately endowed vocational schools have confined their training to the "M" and "T" factors only, a weakness that has been subjected to deserved criticism.

Occupational intelligence the chief aim—Merely organizing occupational experiences for training as a substitute for the old pick up method is some improvement. But it does not get us very far unless both processes and functioning facts are so taught that they give understanding to the worker and habits of resourceful thinking with these facts in the processes, situations, and oppor-

tunities of his employment. Only in this way can the native ability of any people be utilized to the full in the economic field.

Occupational intelligence vs. social intelligence—Let us grant that vocational education can and does promote social welfare by training workers in operations and processes, and that in addition it develops their original capacity in the special ways required for various occupations and pursuits. There still remains the question as to how far such intelligence carries over into other fields. Given a capable mechanic, or a capable professional man, that is, capable in his own specialty, how far will he prove to be socially capable? In short, how far will his intelligence as developed in the performance of his special line of work make him intelligent in dealing with other social problems? How far does the fact that a man is a prosperous farmer or a capable book-keeper or a successful doctor or electrician insure that he will also be an intelligent citizen?

A layman's test—Here we have two theories: The first is that he will be more intelligent and the second that all intelligences are special and do not carry over from one field to another. The answer to the question is probably best found in actual experience. A man is faced, for example, with the necessity of making a decision regarding some matter entirely outside his means of livelihood. This may be some question of national policy, such as the League of Nations or the World Court, on which he must cast his vote, or it may be some difficult neighborhood problem. On the basis of our own experience would we say that, on the whole, the skilled worker taken as a group would show more intelligence in his action than the unskilled worker? Would we say that the professional group would show more intelligence than the working group? Would we say that the agricultural group, taken as a whole, shows more or less intelligence than either of the others?

When we consider the action of different economic groups in the social field there is no evidence to indicate that any of them

make wiser decisions than the others. For years the possession of this government lay between the two great parties, the Republican and the Democratic. In every political battle between these parties on the issues that divided them, both could not be right; hence those who voted for one set of policies were right and all others wrong. The first group acted intelligently, let us say, and the rest unintelligently. Can it be said that on the whole the Democratic party was composed of one set of occupational groups and the Republican party of another? Since both parties represented every occupational group, some representatives of every occupational group voted intelligently while others from each of these same groups did not.

When any social group advocates a certain point of view with regard to some social question, can we predicate from this the occupations they follow, or the amount and kind of ability required for the successful pursuit of these occupations? All our experience would tend to indicate that this is not true. The best conclusion we can draw would therefore seem to be that occupational intelligence is a special type of intelligence varying with the particular character of the occupation, that it is developed only through experience in that occupation, and that we have little or no evidence that this special intelligence so developed carries over for use in another field.

So many factors enter into this question that, it must be admitted, any final conclusion is difficult to secure and is perhaps debatable. It would seem on the whole, however, that in the three great fields of education—education of the individual, education of the citizens, and education of the economic producer—there is little carry over of intelligence as manifested or measured by action.

The answer of the psychologist—If we accept the statements of modern psychology, these things are sound: Facts are not education, and the mere acquisition of facts does not constitute training. Training takes place only as the mind is taught to use sound

thinking procedures in dealing with facts. Facts may be fed into the mind as a thinking machine and give ideas as a "product." Facts from any field fed into the thinking machine for use in that field do not necessarily prepare the machine to act more effectively when it is fed with facts from another field in order to get ideas for use in that field. No one would argue for a moment that the experiences of a bricklayer with the facts of his trade make him more capable of using the facts needed by a farmer or a politician! So far as any gain in correct habits of thinking with facts,—that as we shall see later is quite another question.

There is no such thing as general training of the thinking machine to function with equal power in all fields. Hence, job intelligence in one field, as for example in any vocational field, does not necessarily produce corresponding job ability in another vocational field; nor does it predicate corresponding capacity in any field of civic, social or intellectual action. Some of the greatest "savants" in the world are numbered among our least intelligent citizens when they are called upon to make decisions on matters outside their specialties. A man may be, and frequently is, very intelligent vocationally and very unintelligent socially. On the other hand, he may be very capable socially and very incapable vocationally.

Subject matter and training in correct thinking—According to modern psychology, the native quality of the mind varies greatly as between different individuals. This native quality of the mind is its inherent capacity to select functioning facts correctly; to weigh and evaluate them with regard to any given problem; and from this series of operations to derive ideas, as a result, on which decisions are based in dealing with the problems. This capacity is claimed to be shown and to at least some extent measured on a relative scale by the so-called intelligence tests. When this thinking capacity, or, as it may be called, intrinsic intelligence, is trained through exercising itself repeatedly by thinking with facts and experiences in any given field, it gains in what may be

called "mental skill" or "dexterity" in selecting, evaluating and weighing functioning facts in that field. As a result it comes to better and better decisions as it gets more and more practice. The maximum limit of thinking ability in any case is, of course, the intrinsic intelligence of the individual. All other things being equal, the greater and intrinsic intelligence, the greater the demonstrated ability "on the job."

Hence, we find in all fields different individuals showing marked differences in the ability to select, evaluate and weigh facts and experiences, even with equal and similar training. Were this not the case, we would not have different grades of performance among doctors, lawyers, engineers, mechanics, social workers, business men and workers in all fields, as shown by their varying success with the same problems in their respective occupations or professions.

In the past, and under the doctrine of formal discipline, it was assumed that working with certain kinds of problems which called for thinking with certain kinds of subject matter, trained the intrinsic intelligence better than if any other kind of subject matter were used. This was thought to be true, for example, of the classics, formal mathematics and other subjects that still find a place in the programs of our general schools. Conversely it was held by many educational groups that "thinking constructively" about thinking material bearing on problems in the vocational field was of far less value for training in thinking. In other words, the training for any occupation, the experiences gained by solving problems in the pursuit of that occupation, especially if it were not a learned profession, had much less educational value than training in such preferred subjects as Latin and Greek, Algebra and Trigonometry, Formal Grammar and General Science.

In this connection attention may well be called to the results of a recent study made by Dr. Edward Thorndike as to the value of different kinds of subject matter for training an individual to

make the most of his native ability. After three years of exhaustive study of the problem, his conclusion is that one kind of subject matter is about as good as any other for training the intrinsic intelligence of an individual efficiency.

He found that any subject poorly taught gave correspondingly poor results in the development of a thinking intelligence while any subject well taught produced correspondingly good results. All subject matter investigated produced both good results and poor results in the training of intelligence. Every subject matter properly taught produced good results. The difference between desirable and undesirable results was not due to the facts or thinking stuff so much as to the training process employed. Home economics well taught is better than geometry poorly taught. When presented equally well, manual training is as good as a foreign language for training native ability.

So far then as intrinsic intelligence exists, and so far as it is the basis of social intelligence, vocational education is as effective as general education for promoting social efficiency; no less and no more. This explodes impartially all the extravagant claims made by the advocates of this, that or the other special form of subject matter that it has special potency in "developing brains" or for equipping brains for service in all fields.

What vocational education contributes to social intelligence
—What contribution then does vocational education make to social intelligence? First, it can train the *intrinsic intelligence* of a man to work effectively with facts in the vocational field in which they are to be used. After all, job intelligence is a form of social intelligence and sound vocational training contributes to the latter very powerfully through its effect upon the former. Second, there undoubtedly is some carry over from one field of training to another, not of powers or general faculties or intelligences, but of what might be called tendencies, practices, methods, habits—call them what you will—of using resourceful and sound thinking procedures in dealing with facts, to meet situations.

Moreover, since the great majority of these situations are concrete, the degree of efficient thinking used is easily checked by the performance of the individual in executing his decisions. Finally, there may be added the carry over of ideals or standards of workmanship or performance, which are themselves probably only the results of correct thinking. For our purposes here we may disregard as comparatively negligible, the carry over of special facts (subject matter) from an occupation since most of these facts are pertinent to the occupation only and have little or no functioning value in civic and social problems.

The carry over of thinking habits—There is undoubtedly a carry over from one field of subject matter to another of what might be called thinking procedures or methods of handling facts—in short, habits of thinking. These thinking procedures will usually be sound or unsound according to the way in which the individual has been trained to deal with facts. If he has been taught only to remember, he will rely on memory to recall facts, but will neither know what facts he needs for a given situation, nor what to do with those he can recall.

If he has never been taught to think with facts, his attempts to do this will be painful and most of them will be inhibited. If he has been taught to think only with abstractions, he will not know how to collect and uses the vital facts of real situations. If he has been trained to think superficially with insufficient facts, he will continue so to think. If he has never learned to use accepted methods of reasoning, his conclusions will be false or unreliable. By sound thinking procedures we mean the operation of the mind or thinking machine in those ways in which human experience has learned to use it effectively. As facts are processed through the mind of any individual, this thinking procedure acquires, in proportion as it is used properly in many situations, resourcefulness in getting facts, in selecting facts, in organizing facts, in thinking or reflecting about facts, in forming correct ideas from facts and in drawing conclusions from facts for use in real situations.

When these procedures or ways of working with real facts have been repeated enough to fix them, they become habits of thinking which by constant practice in their use finally become almost or entirely instinctive and automatic. To the extent that they are sound and resourceful these thinking procedures or habits are effective in dealing with the facts and demands of the work or field in which they have been developed. But as habits they are transferred and are usable in any other field, social or economic. Some day this democracy will choose as its public men those who have both native ability and trained habits of thinking. It will get both when it measures men by what they have already shown themselves able to do. And they will come from every walk of life and every economic field!

Effective training in thinking habits depends upon two things: 1. the natural interest of the pupil in the subject matter and its objectives and therefore in the thinking procedures relating to it; and 2. the efficiency of the training in carrying out these procedures.

Interest in subject matter essential to effective training—At one time both of the authors of this book were employed as teachers in high schools, widely separated geographically. There each of us served for a time as what might be called “general purpose horses” giving instruction in a number of different subjects. In the sectioning of pupils, a considerable number of both boys and girls came to us for instruction in these subjects. We found what every other teacher so situated has found. Not only did these pupils show marked differences in their ability to think in the same subject matter, but the same pupil always showed marked differences in his ability to think in different subject matter or “teaching stuff.” We also found in every case that the ability of these pupils as measured, not by mere memory performance, but by intelligence in the acquisition, selection and use of facts, corresponded exactly with their interest in the subject taught.

We also found that the amount of real thinking done by the class was greater in the subjects where concrete teaching material

could be employed. Many pupils, for example, who were entirely uninterested and who made very poor records in their thinking, improved at once when set to work in science laboratories where the experience secured was first hand, concrete and very specific and thereby provided a clear visualization of the facts used in thinking. The truth is that, entirely aside from the ability of the teacher to train in thinking processes, the results obtained with any individual depend upon two factors: his interest in the subject matter and its objectives, and the degree to which his thinking deals with concrete and first hand experiences.

Until very recently it was generally believed that if a pupil stood high in any school subject, he would also stand or rank correspondingly high in all the other subjects of his course. About fifteen years ago, however, Thorndike and others undertook to find out whether this almost universally accepted belief was supported by the real facts. They made a study of the class work and rankings given to many thousands of high school pupils in different sections of the country. This data showed that there was very little correlation between the grades or rankings of these pupils in different subjects, with the exception of certain pairs of subjects where much of a somewhat greater correlation or tendency toward similar rankings seem largely accidental and unexplainable. Contrary to popular notion the results showed that instead of any tendency for a given pupil to be equally "good" in all subjects, the general and pronounced tendency is for his proficiency, as measured by marks and rankings, to vary widely as between different subjects—so widely indeed that it is impossible for any one to predicate, from the showing or rank of any person in any subject, where he will stand in any other subject.

These results not only exploded both the general faculty psychology and the doctrine of formal discipline, but forced us to find some explanation for this wide difference in the proficiency of the same individual in different fields of knowledge. Every

pupil must of necessity bring the same neural set up—the same mental or thinking machine—to different class rooms and teachers. Moreover, the large group of some 17,000 or more pupils studied by these men doubtless encountered, as a group, teachers of every grade of competency or incompetency in every high school subject. Obviously only one possible explanation remains for the difference in proficiency of virtually every one of these young people in different subjects, and that is the difference in his interest in the subject taught.

Interest factor strongest in vocational subjects—For most people the strongest interest factors are connected with earning a living and therefore with securing an occupational mastery. In vocational training the average individual, on account of his greater interest, secures a more effective training of his thinking machine than he does in other fields or subjects where the occupational incentive is lacking. This commanding motive undoubtedly spurs the effort to think. When this effort is properly conserved and directed, he sets up the habit of attacking all problems of the vocation in which he is engaged by using the thinking procedures that apply to it. To the extent to which the habit of using this thinking is pleasurable because it is successful and brings desired results, and to the extent to which this habit is fixed by repetitive experience, it becomes an asset for use in any other field in which these same thinking procedures apply.

Here we have the true explanation for the accomplishments of the "self made man," who without the benefit of college or high school education displays what is to the academic an amazing ability to establish and carry on great enterprises sometimes of widely varying character. Somehow, in his experiences with real situations and real facts, he has hit upon ways of thinking which have proved successful and which he has developed into habits of thinking—an asset valuable to him in all undertakings. It should be the chief business of every form of education, as far as possible, to give such habits to everyone by systematic train-

ing in functioning facts rather than in the mere acquiring of abstract and socially useless knowledge.

Conditions for training in thinking best in vocational education—Effective thinking must be based upon clear and definite visualization of the facts to be used as thinking material. This “mental seeing” of things is most clear and effective when it is based upon first hand and concrete experience. Both of these conditions are found to the maximum degree in vocational instruction as contrasted with all other forms of education.

In any real vocational class, every member of the group is either a worker already employed and has had the same kind of experiences in the occupation about which the instruction is to be given, or he is a beginner to whom these experiences can be given in the school shop, office, home, farm or in a commercial plant as a part of the training. In these experiences he encounters real problems that must be met. He is accustomed to think in very concrete ways about these problems and how to meet them. Consequently, he brings to the training process a very clear cut mental picture and “feel” of machines, processes, devices and other affairs of his work.

It has already been pointed out that the setting up of any habit of thinking and the mastery of any thinking procedure—like all other habits or procedures—require intensive and adequate experiences in the uses of the same kind of facts to solve the same kind of situations. Just as in acquiring a command of a production job a workman must go through a series of “shots at the target” whereby he gradually gains mastery, just so when learning to think the individual must have a series of experiences in thinking the same way with the same thinking stuff; that is, he must have repetitive training in the same thinking problem.

In the training of a gun crew in the Navy, it has long been known that perfect cooperation and accuracy of fire can only be secured by steady repetitive training. When a ship is training for target practice, this training is the one thing to which atten-

tion is devoted so far as gun crews are concerned. There is no scattering even between guns. If it is training on a 12 inch rifle, it is training on 12 inch rifles. If it is training on a secondary battery, then it is training for different crews on secondary batteries. This is the way gunfire in the Navy has been developed to its present high efficiency as well as resourcefulness in meeting emergencies. Vocational training provides both the best opportunity for repetitive training in thinking on the same problem and for using in that thinking facts clearly visualized, because these have been taken from familiar experiences in the work of students or apply to these experiences in a direct way.

It must be admitted that every crime which can be committed in the training of individuals by any school can be and is frequently perpetrated by vocational schools. The teaching of theories before practice instead of theories along with or following practice; the presentation of abstract ideas before an adequate apperceptive basis has been built up through concrete experiences; the excessive use of memory as a substitute for reasoning; the failure to tie up job information and technical job knowledge with every shop process and project at the time when needed—all these blunders are as disastrous in the vocational school as corresponding practices in other schools.

Nevertheless the fact that the individuals in any vocational training course are there because of their interest and hence form a selected group, the fact that they can be trained to think in terms of definitely defined problems and situations, and the fact that they are given concrete and first hand experiences as food for the thinking machine, means that they can be trained far better in thinking procedures than by any other form of education.

If the foregoing discussion has served its purpose, it has shown that vocational education offers a greater opportunity than other forms of training for developing habits of thinking which as habits may be carried over by the individual and used in dealing with civic and social problems. No claim is made here that vo-

cational education is a specific factor in promoting general social intelligence. At most it can only be regarded as an important agency, the nature of whose training develops habits of thinking which function, as a by product, in other fields so far as these habits apply.

Morale—Morale is not so difficult a thing to detect and feel as it is to describe. In general, however, the morale of any person toward any thing in which he is engaged is the sum total of his attitudes toward the enterprise. The three chief characteristics or traits of good or high morale are: willingness to conform to the rules of the game whether these be the regulations of his employment or the will of the majority in a Democracy; the recognition and following of capable leadership in shop or office or civic affairs; and the acceptance of the established aims and procedures of the game whether these be those of his employer, of his football coach or of the community or neighborhood in which he lives. Just as there are two different kinds of intelligence, occupational and social, we can recognize both an occupational and a social morale.

Occupational morale—Probably nothing has done more to change methods of organization and administration in industry than the recognition that, so long as human beings with their varying personalities, aptitudes, interests and abilities must play their part, human attitudes toward employments are and will remain the dominant factor in economic production. In other words, the morale of workers has come to be recognized as more important than any other condition of success in a business enterprise.

This can be tersely expressed by enlarging Richard's Formula for Job Efficiency given in the early part of this chapter as follows: $E \propto S \text{ plus } T \text{ plus } I \text{ plus } M$.¹ A simple statement of this variable equation would be that while the value of any workman depends on his skill (S), his technical knowledge (T) and his

¹See footnote, page 43.

job intelligence (I), these are of but little avail unless his morale (M) is such that he gives himself freely and earnestly to his work. There is little question but that an improvement in the working spirit of any group will produce better production results in any business than any corresponding improvement in any other factor of efficiency.

Vocational education and morale—All experience indicates that vocational education contributes largely to the development of a desirable feeling among workmen toward their employments for a number of reasons: First, if properly organized, the learner progresses easily and with increasing self-confidence. This is in itself a tremendous factor in developing a desirable condition of morale toward jobs. Nothing is so depressing in any occupation as a feeling of inability to master the problem or the task. Anything which discourages, promotes poor morale. Anything that encourages, promotes good morale. The learner who successfully progresses step by step believes that he will ultimately master his work. His success from the start promotes his working confidence and self-reliance during his learning period—a mental state toward his work that extends into his after career as a producer and goes far in determining his disposition toward all the situations of his wage earning life.

There is another way in which properly conducted vocational education promotes morale. The learner is spared those discouragements which come from the criticism and jokes of those who consider themselves already competent. Such things do take place so often as to become a custom in many employments where men must learn their tasks by the pick up method. The search for the "round-square bar" and the "left handed monkey-wrench" and all the tricks which those individuals who have already "gone through the mill" feel themselves privileged to play upon the learner in order to convince him of his inferiority, certainly have no desirable effect upon his disposition toward either his fellow workers or his job.

A third way in which vocational education can and does promote morale is through the development of occupational pride. Unless a man is proud of his calling, his zeal for it will never be high. One of the most serious things from which this country is suffering today is the fact that so many men in so many occupations apparently have no feeling of professional or occupational satisfaction and pleasure in their callings or in their own achievements as workers. This, of course, can only lead to one end, that of discontent, dissatisfaction and poor work.

It is encouraging to note that a few national associations of workers and of employers are trying to promote a greater pride among workers in their respective lines. This is particularly important and necessary because the "white collar job," during the last few decades at least, has been held up before the American youth as the only employment socially desirable. Consequently, it is assumed that only the workers in white collar jobs have employments which justify any interest and enthusiasm in their proper performance. The doctor or the lawyer or the minister must of course glory in his occupation, but it would be impossible for a corresponding state of mind to exist on the part of a plumber or a carpenter or a sales girl!

Fortunately, this situation is now rapidly changing for the better as the extreme importance of morale in all occupations has become more and more evident, and as progress in vocational education is emphasizing the importance of the productive and distributive work of the world. All experience indicates that the surest and quickest way to dignify any calling or employment is to train people efficiently to meet its requirements.

General and social morale—Just as in the case of occupational versus social intelligence, we have the question as to how far occupational morale carries over into the social field. The same factors which were there discussed would tend to lead to the same conclusions: There is very little reason to believe that job or occupational morale carries over into the social field as social

morale any more than job or occupational intelligence carries over into social intelligence. Many workmen having a high job morale also have high civic morale. On the other hand, any one familiar with employments knows that there are many workmen who are beyond reproach in their daily work where they are industrious and proficient, but who are very poor and often very undesirable citizens in other ways. Perhaps the clearest illustration of this is the lumberjack of the north woods at work and at play. We cannot rely either upon job morale to get social morale, nor upon social morale as a means of getting job morale.

Vocational education promotes social morale only by conserving individual morale. The social attitude of any group is something more than the sum of the attitudes of the individuals composing it. Nevertheless, individual morale is the basis on which all social morale rests. Any agency which promotes individual morale contributes to general social morale.

Morale affects individual stability—It needs no great argument to show that the mental state of any individual affects his stability and in this way affects the stability of any form of society which is dependent upon the condition of mind of its people. The measure of the morale of an individual is not what he does under the ordinary and favorable circumstances of life, but what he does in the face of distracting emergency and unexpected catastrophe. Two men employed in the same occupation in the same plant may at a time of business depression lose their jobs on the same day. Under the stress of this misfortune, one man goes to pieces and becomes a loafer and a parasite. The other keeps his head and often makes his adversity the stepping stone to a better position. Illustrations of this kind can, of course, be multiplied without number wherever different individuals have to face the same emergency or the same catastrophe.

Stability affects individual morale—It can be said with equal truth that stability greatly affects morale. It is a matter of

common knowledge that it is usually the unsuccessful individual who is dissatisfied with things as they are. Unstable in the circumstances of his personal life, he becomes unstable in his reactions to society. Hence the I. W. W. and other radical organizations of that type. The individual who is regularly employed and comfortably situated tends to become stable in his social attitudes. When economic or social disturbances threaten, he usually faces the questions at issue squarely. He may have pronounced ideas as to the justice or wisdom of this, that or the other policy, but his disposition usually is to deal with the matter under the standards and procedures of the existing social order. On the other hand, the group of irregular and intermittently and unsatisfactorily employed has many members who are constantly advocating immediate and radical changes and who to gain their ends will defy the law itself.

The way this splitting of men into groups works out can be found in the history of every mining camp as well as in that of many political disturbances. A new camp is organized. Soon it becomes infested with socially undesirable individuals. They go to pieces under the freedom of the mining camp where law and order have not yet been definitely established. Their excesses make necessary the determined efforts of what is often called a vigilance committee. This committee is nothing more or less than the results of group action by those citizens of the camp who still retain the social standards and attitudes they brought from more civilized communities. They address themselves to the extermination of the lawless element and the establishment of orderly government. Any mining camp that fails to have this law abiding group goes to pieces. Only those possessing it achieve stability and permanence.

Vocational education promotes morale by promoting stability—Vocational education promotes morale because it promotes stability by: turning parasites into workers, increasing the skill and capacity of workers, increasing the worker's lines of economic

efficiency. All these bring about conditions conducive to satisfaction and hence make for stability.

It must be remembered, however, that vocational education in itself can do no more than equip an individual to make the most of his economic assets. In proportion, however, as this is done, conditions are created which make him more content and this greater satisfaction tends to result in a superior individual possessing better social morale. This relationship of vocational education to better group morale is well shown by the seven steps in the chart below, the first four of which may well be called premises, and the last three of which might be called resultants:—

Vocational education→Better equipment→Better economic service→Better living conditions→More satisfactions→Better individual morale→Better group morale.

Making parasites into workers—This processing of vocational education upon human beings is very plain when it succeeds in turning a parasite into a worker. Usually the parasite has little, if any, individual or social group morale. Most of the people who are running about the country advocating all kinds of foolish schemes have no regular employment and could not hold it if they had. Parasitism in itself makes for dissatisfaction. The tramp and the drifter are parasites in many cases because what natural assets they possess have not been properly trained and set to work. Without the satisfactions of life, their morale is grievously affected.

There is another type of parasite, however, whose economic conditions may or may not be low, but whose individual and group morale is low. In a society whose general standards are that everyone should work, they feel out of touch with the great mass of their fellow men. They lack the sense of solidarity with the crowd. They are deprived of the stabilizing aid of people as a regenerating influence which comes from team play in a com-

mon task and from a sense of achievement in something that makes for the common good. Any agency which can take care of idlers of this type and confer on them the willingness and the ability to work, promotes to that extent individual morale which in turn promotes social morale.

If all of the dangerously dissatisfied elements in this country could be so equipped that they could do in a first class manner the kinds of work which they are potentially best fitted to do, the results would in our opinion be astonishing—far beyond any immediate results to be gained by either tract or preachment, repression or legislation.

If this could be done, unfavorable idleness would also be reduced to a minimum which would vastly increase our social assets which would in turn enable us to improve living conditions which would in turn increase satisfactions which would in turn cause greater stability which would in turn promote morale.

Reduced idleness→Increased social assets→Improved living conditions→Increased satisfactions→Greater stability→Better morale.

Increasing skill and capacity of workers—It has already been pointed out in a previous chapter that the better utilization of human and natural resources gives opportunity for social advancement and development. This utilization is secured in proportion as every individual is so trained that his native ability and aptitude can be marketed and used to the best advantage. This is precisely the task that vocational education has for its objective, if it be true vocational education. We are here concerned with the effects of such a program upon the occupational capacity and skill of workers, of all kinds, engaged in any gainful occupation, agricultural, industrial, household or commercial.

All human experience goes to show that as their training is improved the ability of workers in any employment increases correspondingly, as do their confidence and ambition, their satisfac-

tion with the job and its opportunities, and their earning power. All these in turn lead to better living conditions, high satisfactions and improved morale. These things lie so much within the experience of every reader that they require no further mention here.

In a democratic society with its absence of horizontal stratification, it cannot be assumed that an individual will always follow the same occupation as he progresses through life. The outstanding characteristic of modern production in all fields, as has been shown, is the creation of new skills and new demands in old employments as well as the creation of new employments and therefore of new demands. Older civilizations are almost as amazed at the way in which American workers shift the character and the grade of their employment as they are at the flux and shift in the machines and processes we employ. Consequently, any system of vocational education which is to conserve this democracy must be prepared at all times to help men and women to meet the changing demands of occupations and of changed occupations. In proportion as it does this, the range in lines of economic efficiency of a worker or a group of workers will be increased.

If the son of a carpenter must be a carpenter all his life, and the grandson of a carpenter must be a carpenter all his life, then a thorough training in one stated job might in a measure fit him for life and there would be little need or call for learning other job skill or knowledge. This not being true in a democracy, a man must continually acquire new abilities in old employments or for new employments as he goes on. From this standpoint, the task of vocational education with any given individual can never be said with any safety to be finished.

The foregoing part of this chapter has shown the need of all our people for help in meeting requirements when old jobs disappear, jobs shift in their demands, new jobs with new requirements are set up as a substitute for old jobs, or new jobs arise in

new fields. In proportion as these situations are dealt with by effective vocational training, society provides a form of insurance against unemployment; increases the earning power of the worker; and gives him a more secure and optimistic outlook on life, all of which improve his social attitudes.

The whole previous discussion has centered around the idea that to the degree living conditions are improved and economic pressure is reduced, individual and social morale is increased. In proportion, also, as every individual is able to serve to the maximum degree of his capacity, surplus wealth is created which, if intelligently applied, makes for better living conditions and reduces economic pressure. This surplus wealth also creates the opportunity for the intelligent use of leisure and ultimately makes for the possession of greater leisure to be used. Finally, such a program develops the individual and social spirit which promotes the more intelligent use of surplus human assets. If this chapter has served its purpose, it has shown that vocational education is one of the most important forms of education by which the modern Democracy may profit as it progresses toward its ideals and its ends.

QUESTIONS AND POINTS FOR DISCUSSION

1. Take any job in any occupation with which you are familiar and which may be regarded as reasonably difficult. Take a corresponding job in some standard general educational subject, such as making a translation of a few lines of "Cæsar's Commentaries," or the demonstration that "when two straight lines intersect the opposite exterior and interior angles are equal." Make a two column table showing the demands made on the "worker" in doing both jobs under such headings as: Facts that must be taken into consideration, points on which these facts must be weighed and evaluated, resourcefulness, operating points to be covered, complexity of the problem, concrete or abstract character of the demands upon the "worker," etc.
2. From any good standard text on the subject, write down the claims made that the classics are superior to other general educational subjects in promoting intelligent thinking. Analyze these claims in the light of the statements made in this chapter of this text

3. Cite a number of cases that have come within your own experience in which ability in one field has apparently carried over into another completely different field. See if you can reconcile these facts with the statements in the text.
4. Is willingness to run for office a sign of good or poor civic morale?
5. On what grounds would you justify the statement that social and occupational morale is the greatest asset of any social organization?
6. Which of the following pairs of jobs requires the greater job intelligence? Give reasons in each case.
 - a. A delivery man for a department store.
A motor man for an electric car in a city.
 - b. Paying teller of a bank.
Usher at a theater.
 - c. A policeman.
A traffic officer.
 - d. An office boy for an electric light public service corporation.
A bootblack.
 - e. A salesgirl in a department store.
A bookkeeper in the same store.
 - f. A grade teacher.
A high school teacher.
7. What would be the relative demands as to "M," "T" and "I" in the following new and old forms of doing the same job?
 - a. Sweeping a carpet.
Cleaning the same carpet with a vacuum cleaner.
 - b. Mowing with a scythe.
Using a mowing machine.
 - c. Adding a column of figures "by hand."
Adding the same column with an adding machine.
 - d. Writing a letter by long hand.
Writing it with a typewriter.
 - e. Washing clothing by hand.
Washing it with a washing machine.
 - f. Filing a square surface.
Doing it with a shaper.
 - g. Sawing the end of a board to make it square.
Doing it with a miter box.
 - h. Spinning with a distaff.
Tending a spinning frame in a textile mill.
 - i. Rowing a boat.
Driving the boat with a gasoline motor.
8. Select six jobs with which you are familiar and indicate for each the relative values of "M," "T" and "I" in the Richard's formula.

9. Give four examples of "judgment jobs" with which you are familiar.
10. Can manipulative skill and the functioning technical knowledge be taught without also training in the exercise of job intelligence? How?
11. In your experience is there any relation between the ability of political leaders to deliver "blocks" of votes and the occupations of the members of those blocks? Any evidence that can be cited in support of your opinion?
12. The so-called "silk stocking wards" in American cities are, on the whole, occupied by people who follow occupations that are commonly assumed to require superior job intelligence. Why don't they vote?
13. How do you reconcile the statement in the text that there is little carry over of special job intelligences with the results of Thorndike's test? Do the two statements contradict each other? How?
14. If a man has been trained in proper thinking procedures on one sort of subject matter, or through one kind of experiences, why will he not come to correct decisions when he is faced with a problem in a new field? Why does an expert in geometry fail when he undertakes for the first time to drive an automobile in traffic?
15. Do we think as resourcefully on problems in which we are not interested as on problems in which we are interested? Why?
16. How does this square with the results of Thorndike's investigations described in this chapter?
17. What do you understand to be the difference between instruction and repetitive experience? Give five examples of each.
18. Is it the job of an athletic coach to instruct or train? Why?
19. Can you suggest why, as a rule, there is much less need for "school" discipline in a trade school than in a general educational school?
20. Make a comparative analysis of the conditions affecting the following in a vocational school and in an academic school:
 1. Interest. 2. Concreteness of subject matter. 3. Repetitive experiences. 4. Opportunities for resourceful thinking. 5. Opportunities to apply specific knowledge to the solution of concrete problems. 6. Opportunity to check the correctness or incorrectness of the decisions made as the result of thinking.

BIBLIOGRAPHY

Mind in the Making. James H. Robinson. Harper & Brothers, New York.

An Analysis of the Trade of Bricklaying, Together with Suggestive Courses of Training for Apprentices and Journey-

men. Bulletin No. 95. Federal Board for Vocational Education.

An Analysis of the Railway Boiler-maker's Trade. The same. Bulletin No. 69.

A Survey and Analysis of the Pottery Industry. The same. Bulletin No. 67.

Theory and Practice of the Machinist's Trade. The same. Bulletin No. 52.

Analyzing a Poultry Enterprise. The same. Bulletin No. 75.

The five bulletins listed above illustrate the application of the methods of analysis to various occupations in the attempt to determine the "M" and "T" values in the Richard's formula.

The Instructor, the Man and the Job. Charles R. Allen. J. B. Lippincott Company, Philadelphia.

The section on the Classification and Identification of Trade Knowledge describes the method used in the preparation of these bulletins.

The Foreman and His Job. Charles R. Allen. J. B. Lippincott Company, Philadelphia.

The section on the analysis of a supervisory job describes the application of methods of analysis to responsibility jobs, instead of their application to operating jobs as described in the other book. Both books together deal with the application of Richard's formula to these two types of jobs.

Educational Psychology. Edward Thorndike. The Science Press.
"What Do Mental Tests Measure?" Thorndike and Others.
Journal of Educational Research, March and April, 1921.

Human Efficiency and Levels of Intelligence. H. E. Goddard.
Princeton University Press.

A very clear and simple presentation of the conclusions reached by the group of experimental psychologists who believe that intrinsic intelligence is a fixed quantity for each individual.

The Iron Man in Industry. Arthur Pound. The Atlantic Monthly Press, Boston.

A very able presentation of the point of view that the development of machines relieves the worker of any demand for job intelligence.

Report of the Commission on National Aid to Vocational Education. Part 1, Report of the Commission. Part 2, Hearings Before the Commission. Government Printing Office.

This report resulted in the passage of the National Vocational Education Act. It contains much discussion of the sociological and economic aspects of vocational education of less than college grade, both in the report itself and in the statements made at the hearings.

Report of the Commission on Technical and Industrial Education. Massachusetts, 1907. Public Document.

This is the so-called "Douglas Report." It is the report on which the original legislation establishing state aided vocational education of less than college grade was based. This legislation in Massachusetts antedated the passage of Federal legislation by several years. Gives both the social and economic arguments for this type of education in a state lacking natural resources.

This report is generally regarded as a "classic" in the history of the development of vocational education in the United States. At present it is almost impossible to secure copies, but many libraries contain them where they can be consulted by any one who is interested. This report was also reprinted in a publication of Columbia University.

Report of the Commission on Industrial Education. Wisconsin, 1907.

This report is equally important as initiating the legislation establishing a state program of vocational education in Wisconsin, and as giving the arguments as to its sociological and economic functions. Also difficult to obtain at the present time. Usually to be found in libraries. Not obtainable from the Wisconsin State Department of Vocational Education.

CHAPTER IV

THE IRON MAN

Undoubtedly the whole social trend is a continuous demand for the increased production of goods at a lower cost. This gives a constant spur to the discovery and invention of new tools and machines, new operations and processes. As a result we have had and will continue to have a steadily increasing use of the "iron man," which is a picturesque phrase used to describe the dominance of the machine tool in American production.

A second continuous demand is for a higher quality of service in every field and grade of work. Hence the specialist who gains superior skill in some branch of a profession by devoting his entire time to its study and practice; and the specialized worker who acquires, by constant practice, skill and speed in the operation of a machine. William Mayo, eminent surgeon, and John Smith, linotype operator on a modern newspaper, are the same kind of response in different fields to the social call for efficiency which only the specialization of ability can satisfy.

The theory of the iron man—Certain people have advanced this theory: The machine tool becomes constantly more automatic. More and more the individual is replaced by the iron man. There is a decreasing need of training for economic ends, in either skill or knowledge, because there is less and less demand for their use in employments. The constant trend is away from the training of the mass toward the need for a limited number of highly trained technicians to devise the machine and direct the worker. Hence the great importance of training for leisure only. The specialized tool and the specialized workman are increasingly

able to produce sufficient goods to satisfy the world's needs in less time. This has brought reduced hours of labor and will continue still further to decrease the time a worker must give to his job. Properly used, this leisure serves as an offset or relief to the monotony and strain of serving the iron man. It is a social waste to train workers for economic efficiency in a machine world where such efficiency is not required. If this statement is true, it would be social wisdom to use all training resources in fitting education to its best applications to leisure.

If the data on which rests the foregoing social and educational theory of the iron man are correct, then the observations and conclusions of the theory are sound. Since the great majority of people are accepting the idea that vocational education for ordinary employments is needed and must somehow be provided for by public and private effort, it becomes highly important to examine into the grounds for this directly contrary idea of education for culture only.

The professional specialist vs. the specialized worker—To avoid confusion, it should be made plain here that the question at issue has nothing to do with the professions or with experts in special subjects within professional groups. The demand for higher grades of service in some of the older professions has forced specialization with corresponding training. Medicine, for example, has developed surgery and surgery has in turn developed operating specialists. Rising standards of efficiency and the need for expert service in many new productive activities have brought about the same situation in every branch of the engineering field. This is a matter, however, entirely independent of the specialized worker in the field of production and the iron man theory. Those who hold this theory admit at once the need for the highly trained technician and recognize the value of specialized education, as long at least as it is collegiate in character and professional in grade.

No one debates for a minute the value of training people for

a better personal and social use of their leisure hours. This is not the issue that has been raised. Rather is it the question of whether education should be all for leisure and none for work, or whether it should be some for leisure and some for work. In considering this question, we assume two things commonly accepted as true: The development of machines, the specialization of tasks and the large scale production of more goods at less cost have, in their total effect, marvelously promoted human well being. The further development of mechanism and the subdivision of tasks are inevitable. Not whether we shall approve or disapprove the iron man, but what education shall do about the iron man is the problem.

The thesis of the supporters of the all education for leisure theory may be fairly stated in this way. There was a time when the goods of the world were produced by craftsmen, each of whom made every part of the thing he produced and made it by hand. This craftsmanship required a certain recognized proficiency in the craftsman. Trade training was necessary to fit him for the high demands of his calling. To give this training, the institution of apprenticeship arose and flourished for a season. This craftsmanship and this apprenticeship have waned and disappeared as invention and discovery have developed the power-driven machine and substituted for the old hand tool, machine tools which do the work formerly done by the craftsman and later by the tradesman.

Constantly these tools tend to be more special in the process they perform and more automatic in their action. This has brought a constant increase in the subdivision of tasks and a constant decrease in the tool work of the wage earner. As a result he has become a mere machine tender in whose work with the machine there is no longer any need for manipulative skill, technical knowledge or job intelligence. There is little, if any, call for these assets—so little that, when necessary, they can easily be picked up on the job. Consequently, the proposal to

give vocational education to productive workers at least, is not only a wasteful program, but a pernicious one, since they need to use all their time and attention in learning how to spend their leisure, and none of their time or attention is required for learning how to work.

Things ignored by the leisure theory of education—The advocates of the idea that training for modern work is unnecessary and wasteful have magnified craftsmanship as a golden age of achievement in creative work and minimized the demands and opportunities in modern occupations for the use of skill, knowledge and intelligence. They have ignored some situations and misinterpreted others. Most of these matters have been fully discussed in other chapters, but it remains here to point out their bearing on the theory and on the issues involved. Among the facts and conditions which have been ignored are all such as the following:

1. The real truth about the old crafts and their workers.
2. The persistence of the small shop.
3. Somebody must make the iron man.
4. The real truth about the demands of modern occupations on their workers.
5. The need for pusher education.
6. The actual demand for vocational education.

1. *The real truth about the old crafts.* In the minds of most people, these crafts included many pursuits and employed great numbers of highly skilled workmen. Consequently, they represented a total body of skill which has been lost from the world with their disappearance. What are the facts?

The total number of these ancient crafts was not much in excess of a dozen. Many of the occupations included within their sacred circle, such as those of the butcher, the baker, the blacksmith, the saddler, the shoe repairer, and the tailor, still persist on virtually a hand tool basis in small communities everywhere,

and to a considerable extent in large communities as well. Here they are followed by a great many more workmen than in the days of English indentured apprenticeship. In the smaller towns and in most of the building construction of large cities, many of the building trades are still carried on "by hand" in the sense that the power driven tool has not supplanted to any considerable extent the uses of hand tool processes. This is obviously true of bricklaying, plastering, and painting and to a large extent of carpentry and tinsmithing. The workers in such employments probably equal in number all the artisans of Europe in the Eighteenth Century.

If it be conceded that hand composition in the printing trade is a skilled occupation, then we have more skilled workmen pursuing this one skilled art in the city of New York today than the total number of craftsmen employed in England at any time during the reign of "Good Queen Bess." During this same century, the total number engaged at any given time in all the skilled crafts of all Europe including England, was very much less than the total number of hand compositors in the United States at the present writing. If it be conceded that the modern toolmaker, who is really both blacksmith and machinist, possesses a skill at least equal to the ancient blacksmith, then we have much more skill in quantity and quality represented by the toolmakers of the single state of Pennsylvania than was possessed by all the iron workers of England at the close of the Seventeenth Century.

These illustrations could be repeated almost without limit and without taking any account whatever of the skills in new occupations and new processes peculiar to the modern age. The truth is that while the iron man has greatly extended the arm of the worker, and has supplanted many hand processes with the machine tool, he has not taken away the hand tool. Because of our larger population and large scale activities, the hand tool is still used much more extensively than in the days before the rise of steam and invention, and *its use* calls today for a greater

total amount of skill (in the sense of manual dexterity in which the word was formerly applied) than was developed by the cruder ages sometimes called "golden." As we shall see later, both hand tool and machine tool call, under modern conditions of production, for the use of a greater amount of knowledge and job intelligence than the ancient world ever knew.

Manual dexterity in the performance of traditional and uniform hand processes the ancient craftsmen did possess, and possess to a higher degree than any other group before or since that time. In their day, this was virtually all they needed to possess or could possess. In the ancient world, skill was necessarily the traditional use of fixed hand tools to perform simple and fixed processes on fixed materials in order to produce a more or less standard article varying from period to period only slightly in design and finish. One has only to see period furniture from the pre-machine ages to recognize this as true and to realize the high degree of hand skill acquired through repetitive practice by the ancient wood worker in the simple, narrow and virtually unchanging processes of his craft. To perpetuate this craftsmanship indentured apprenticeship was established by the Guilds and all the conditions united to make the training of new workers under the masters of the crafts a simple and successful enterprise.

Without printing and other modern means of communication, tradition was the fundamental basis of skill and knowledge. Occupations were few in number, general and standardized in their processes. Simple and uniform always were the tools and appliances and few and slow the changes in them. Old skills were retained and perpetuated, and old knowledge preserved and revered. Seldom was there any call for new skills and new technical knowledge bearing on the craft. As a result skill, and what little technical knowledge was available, remained simple and static. Changes in either were few and slow. The amount of skill and knowledge used was little in variety and degree. There was no need or possibility of its rapid transmission. What there

was, traveled slowly from man to man. Once adapted to the job, the worker needed no readaptation.

For this situation the old apprenticeship, always so highly prized, was an excellent device, as master workers could impart to the apprentice the traditional skill required, in a leisurely, and, on the whole, in a very satisfactory, manner. (See Chapter II on The Economic Theory of Vocational Education and Chapter III on Vocational Education and Human Resources.) Under these conditions the skill required and developed was a doing skill, almost entirely a habit-of-dexterity skill. It was not, could not, and needed not to be a knowing skill, an adaptable skill, a thinking skill, a resourceful skill. The former kind of skill does not meet the demands of the modern world, but we shall see that the latter does. Even if it could be restored, the old time apprenticeship—which taught processes but neither functioning knowledge nor thinking with this knowledge to meet situations—would never equip the modern youth for modern industry. That is why the vocational class is needed to supplement every venture in shop training on the job!

2. *The persistence of the small shop.* So much has been said about the specialization of occupations brought about by the iron man that apparently almost every one assumes every American worker to be employed at some minute task where he tends a more or less automatic machine. Nothing could be farther from the real facts. Admittedly, the tendency in large concerns is to the extensive use of every available labor saving device with its resulting greater specialization of occupations. With the smaller concern, however, this is not the case. Small output, limited capital, jobbing or repairing instead of specialty work, variety instead of uniformity of product—all these tend to make occupations in the small shop more general and more diversified in the number of operations and tasks performed by each worker. On this point the Census figures for 1921 are illuminating. They show that one of every four manufacturing establishments makes

a product of less than \$5,000 annually; one of every two has an output of less than \$20,000; while two of every three establishments do an annual business of less than \$100,000.

To put this in another way, more than four of every ten manufacturing establishments in this country employ less than six workmen; more than seven of every ten employ less than twenty-one workers; more than eight of every ten employ less than fifty-one; and more than nine of every ten have an average of less than 100 workers on their payrolls. Of every thirty-five of the wage earners of all manufacturing concerns, one has five or less fellow workmen; one of every ten has twenty or less; two of every ten has fifty or less; and three of every ten has less than 100 fellow employees. These figures do not include 8,721 establishments where only the owner works, nor 40,924 wage earners reported by 53,999 establishments, each having products valued at less than \$5,000. No account whatever has been taken of the 3,100,000 workers reported by the same Census as engaged in building trades and occupations, probably 80% of whom at least are employed by small contractors whose average labor force does not exceed fifty men. The persistence of the small contractor in the building game is due largely to the away-from-the-shop character of most of this work. As distinguished from manufacturing, all jobs are, on the whole, assembly or fabricating operations, and virtually every job is different in some respect at least from every other. As a result, the building trades and occupations, while using labor-saving devices, are still to a larger extent, than almost any other large field of employment, hand trades in which specialization has not taken away the old time necessity for manual skill and dexterity.

These statistics are not cited to prove that the machine tool does not constantly tend to encroach upon the operations of the workers formerly performed by hand. They are given to show two things: 1. Current assumptions that manipulative skill with hand tools has entirely disappeared are not true. 2. The condi-

tions of much work are such that they will probably never be true.

Barring miracles, the small shops will persist in American life and will continue to employ great numbers of workmen who perform not one specialized process but a considerable number of activities. All these workmen of the small shops and the building trades represent a total population of more than 20,000,000 people, an economic group many times as large as the population of England in the days of "true trade training." They cannot be eliminated either by rhetoric or by silence. Even if it were true, as it is not, that workers in more specialized occupations need no training whatever for their work, what will the advocates of training for leisure only do with the workers in small shops and the building trades? What will they do with 11,000,000 farmers who as individual workers carry on a wide variety of both mechanical and agricultural activities in which they need to be self contained and self reliant? What will they do with 25,000,000 women engaged in household pursuits? What with transportation and trade and public service?

3. *Somebody has to construct the iron man.* Few of those who believe the demand for skill and technical knowledge and job intelligence has waned since the days of craftsmanship have apparently ever given a thought to the tremendous demand for these assets in the construction of all the marvelously intricate and deft machines that now perform much of the hand work formerly done by man. Entirely aside from the inventor and designer, who must somehow learn to know and to do what they contribute, the making of the iron machine himself calls for a great amount as well as a high degree of hand skill itself in cutting to close measurements and in making close fittings and adjustments, sometimes to the ten thousandth of an inch. All gage makers and templet makers, bench men and assembly men, forgers and tool makers, die makers and die cutters, adjusters and finishers, an industrial army greater in number than all the

craftsmen of the middle ages, must have a dexterity and precision in the use of tools beyond the ken of earlier centuries. They must also exercise a job intelligence in the use of a great body and wide variety of special technical and trade knowledge by the side of which that required for the old handicrafts seems both in amount and degree narrow and primitive and negligible.

Equally impressive are the high technical demands made upon a vastly greater number of mechanics, who, while they use the power driven tool in the operations they perform, are required to know and to use a great body of highly specialized knowledge to meet high standards of accuracy and precision in the shaping of costly materials with machines almost as intricate as those they are fashioning. Nor does this statement take into account a great army of mechanics from loom fixers to garage men constantly engaged in meeting the same high demands for exact knowledge and precision in the repair, adjustment and upkeep of costly and complicated machinery. Whatever else the iron man has done, he has created for his own making and his own upkeep a demand for workmanship, special knowledge and intelligence unknown to the ages of simple primitive tools.

4. *The real truth about modern occupations and their demands.* This whole matter has been fully discussed in the chapters on the Economic Theory of Vocational Education and the Training and Direction of Ability. This discussion will therefore only be paraphrased here: As contrasted with the age of craftsmanship, the fundamental basis of skill and knowledge today is not tradition, but the development of science and invention which are constantly producing new machines, new operations, and new processes. Out of this difference have come all others between the old and new economic worlds. Now occupations tend to become special and diversified and, consequently, numerous. Tools are no longer simple but complicated and diversified. The changes in them are many and frequent. Old skills are constantly being modified, discarded, replaced. Correspondingly, old tech-

nical knowledge is constantly being modified, abandoned and supplanted. Constantly are new skills required and constantly is new technical knowledge being developed and applied. Both tend to become more complex and for any given occupation to change rapidly and often.

Consequently, the changes in occupations are rapid and frequent. Entirely new jobs arise to take the place of old ones. New jobs call for new skill and knowledge. Old jobs are being modified by new and strange processes. Skills are being transferred from one occupation to another. All the old time skills are either disappearing or are being adapted to new materials and new ways of doing old things. Workers need to be adapted to new employments many times and readapted to old ones many times. Seemingly, every day brings pronounced changes in employments that force workers to shift from one occupation to another, or to readjust themselves to new demands in old occupations.

When the advocates of no training for wage earning, but all training for leisure see all this shift and flux and see nothing else, they feel justified in the educational policy they propose. In any event, they certainly have the better of the argument with those enthusiasts who, in the face of the foregoing facts, still look to the all-day preparatory school as a solution of the problem of mass training for the workers of a changed and changing mechanical world. When we look on the other side of the picture, however, we find an entirely different story. In all the shifts from the old crafts to modern occupations, certain tendencies have been constantly at work which have changed the character of the demands on workers and made the need for another kind of occupational training for the mass of workers imperative.

These tendencies have been continuously at work for almost two centuries, long enough to bring out in sharp relief the differences between the old requirements upon the craftsman and

those faced by the workers of the twentieth century—differences that may be summarized somewhat as follows:¹

1. The work performed by each individual has become more and more important and its efficient performance correspondingly so.

2. The shift is away from mediocre performance of most jobs to the highest possible efficiency in every job.

3. The modern demand upon every worker in every occupation is for specific efficiency in the specific occupation.

4. The shift in this demand for specific efficiency in the performance of all work is, in general, away from purely mechanical to technical demands.

5. The shift is away from manual dexterity and skill toward the exercise of specific job intelligence in the specific occupation.

6. The shift is away from a training content for a few jobs to a specific training content for every job.

7. This specific training content, whether it be small or large for different occupations, is vital to the specific efficiency of any modern worker in any specific occupation.

8. The specific training content may be given in various ways, but whatever scheme is employed constitutes vocational education.

The whole organization and procedure of the ancient crafts were based on the idea that each workman performed the whole task for himself and by himself. He made every part of the finished article and put it together. His output, as an individual worker with simple tools, was so small that the damage and waste of material caused by poor workmanship became comparatively unimportant. No assistance was acquired by him from others and he gave none to others. There was no need or call for team play or gang play in production. As each worked for himself the productive efforts of fellow workmen were not

¹See Chapter II on the Economic Theory of Vocational Education and the chapter on the Training and Direction of Ability.

affected by his competency or incompetency, nor did the safety of shop or fellow workmen depend upon his reliability and intelligence.

In those primitive days his work in no way concerned the life or health or safety of the public. He made tables and chairs and hats and shoes and loaves of bread, but he did not run the circuits for death-dealing power lines or hurl passengers through space at blinding speed, nor did he cast or forge or fabricate the countless mechanisms and structures upon whose strength and accuracy man must rely. As a result, there was no pressing or vital necessity that every workman should be competent in the performance of every task. Since demand always responds to necessity, there was no call for any high-grade, widespread efficiency. Therefore it did not exist. We hear much of a few eminent artisans, but nothing of the low standards, bungling efforts and poor goods produced by the great body of ignorant, indifferent and incompetent workmen!

The characteristic of modern production, on the other hand, is that the workman performs only a part of the whole task, whatever it may be. In the production game, he no longer makes, assembles or finishes every part of the whole article. In no employment does he work alone. In all his work he requires assistance from others and they from him. He can get nothing done except as he utilizes the services or products of others. All the productive efforts of those associated with him in the larger task are affected in quantity and quality by what he does or fails to do.

With machines and the subdivision of tasks and team play, quantity production has placed upon him and his associates in the total job the responsibility for enormous quantities of costly material, damage and waste in which causes great loss. This is just as true of machinery. There is no part, however small or however large, performed by any worker in the handling of this material but what is vital to the success of the whole job.

The life and safety of fellow workmen now depend on his reliability and intelligence which have become a vital safety factor. In many lines invaded by the omnipresent iron man, the life and safety of the public also depend on him.

All the foregoing discussion may be summarized in this way: He who plans the handling of large quantities of material and the making of large numbers of articles must be more efficient than the man who plans the making of one or only a few articles. He who designs anything to be reproduced many times must be more efficient than the man who designs one thing to be made one time. He who handles or contributes in any way to the handling of large quantities of material and many articles must be more efficient than the man who handles a small quantity of stock to make only one or a very few articles. He who works in cooperation with others must be more efficient than the man who works alone.

One of the authors of this book has followed with much interest for many years the progress of labor-saving devices in rolling mills. Not long ago he watched the successful operation of a costly machine for charging a furnace with steel billets, for removing them when ready for rolling, and for inserting the heated billet in the first pass or hole of the rolling process. This machine performs about twelve distinct tasks which formerly required about twenty men. It is manipulated entirely by a single operator sitting on a suspended traveling platform and surrounded by an intricate array of levers and switches. One single mistake in judgment or one false move in the handling of his control mechanisms would destroy material, ruin product, wreck machinery or endanger the lives of his fellow workmen. Whatever else the operator of this marvelous device may know or be, *he must be 100% efficient on this job*. Whatever knowledge he needs about the electrical power and compressed air he uses, the mechanisms they operate, the material which he handles, the furnace he charges and discharges, the heating and

rolling processes in which he plays such an important part and all the details of the conditions under which he must successfully perform his work—all these things he must know accurately and know in a usable way. Whatever alertness, self-control, quick judgment, and resourceful intelligence in the meeting of ordinary and emergency situations are required—these he must possess and use without fail. By the side of the high demands made upon him in this job, the work of any or all the twenty men he supplanted seems like mere child's play!

Similar illustrations could be multiplied indefinitely if space permitted. Many of them will be found in the chapters on The Economic Theory of Vocational Education, Vocational Education and Human Resources, and The Training and Direction of Ability. Those readers who have no familiarity with modern manufacturing processes have only to contrast these more or less familiar occupations to realize the wide difference in the kind and grade of specific efficiency required in ancient and modern times: ox cart driver and taxi-cab driver; horse car driver and street car motorman; ye old time watchman and a patrolman in a Twentieth Century city. The first time any of us takes a ride in an aëroplane, we will not be concerned with whether or not our pilot is a college graduate or deeply versed in all the theory regarding the construction and operation of the machine. We will be tremendously concerned with the question of whether he is master of all the facts and experience necessary for all contingencies and has the ability to use them when needed!

This demand for specific efficiency in every job has nothing to do with differences in the extent and grade of the requirements made by different jobs upon different workers in the team play of modern production. On some of them, these demands are very low, as in the case of the man who mixes concrete or stokes a furnace. But whatever the responsibility of the worker may be on any given job, the requirement is that it be discharged as nearly 100% perfect as possible. If he handles the mix of

concrete wrong, for example, the batch is spoiled or the building ruined! Indeed it would not be difficult to show situations where the proper mixing of concrete or the proper stoking of a furnace might become more important than the proper making of a tool by a toolmaker. There is only one policy by which to meet such a standard of specific efficiency for all occupations—the better selection of every workman for his job and the better training of every workman for his job, high or low, whatever it may be!

5. *The need for pusher education.* In the chapter on The Training and Direction of Ability, the need and demand of workers for extension and emergency training that will help them to meet the requirements of occupations have been fully presented. As a summary of that discussion, the following reasons for the wisdom and justice of vocational education for wage earners already employed are obvious:

1. Discovery and invention are constantly producing new machines, new devices, new processes, to which old as well as new workers must be adapted and about which they need to be informed.

2. Science and practical experience are constantly increasing the body of technical information and trade knowledge in every occupation, a usable and functioning understanding of which is necessary to efficient work.

3. In the flux of modern industrial life, workers both old and young are required constantly to adapt themselves to the demands of constantly changing old occupations and of entirely new occupations, demands which create a corresponding need and right to help in meeting them through opportunities for systematic emergency training when needed.

4. Constantly rising standards of efficiency in the performance of the duties of every occupation are continuously imposing higher requirements upon all workers in every occupation. These requirements they cannot meet by the pick up method but only

by organized instruction direct in its aim and methods and opportunity in its emergency service. This applies both to training in operations on the job and to classroom instruction.

Perhaps the most conclusive evidence that the foregoing statements are true is furnished by the growth of the correspondence school movement in this country. We are strongly of the opinion that, for most people at least, instruction by mail can never take the place effectively of the teacher and the classroom. Nevertheless, unable to get the help they needed for their work and their ambitions, millions of American workmen have turned to the correspondence school for assistance. The figures are startling. For a period of the first thirty years of its existence, which closed only recently, one correspondence school alone reports a total business of \$175,000,000, virtually all of which represented tuition fees from individual students seeking vocational instruction, most of it for the occupations and pursuits in which they were already engaged. This huge sum would maintain a typical American university for about forty years; two of them for at least one generation; and twenty of them for at least one legislative biennium. Yet all this money was paid out of the pockets of ambitious struggling wage earners, a class least able to meet the burden, for training denied them by a public system of education that boasts of being democratic!

In the year 1922 alone, three correspondence schools alone collected a total of more than \$25,000,000 in tuition fees. Assuming an average payment of \$40 by each student enrolled, which is a liberal estimate because of the great mortality in this kind of education, these three schools enrolled for the one year alone more than 600,000 students, a group almost as large as the total number of students registered that year in all our higher institutions of learning. Yet these figures take no account of all the other correspondence schools of the country whose total registrations for the year must have been equally as large. On the same basis for calculating registrations, the largest school giving

training by text book and by mail must have dealt with at least 4,375,000 students during the thirty-year period just closed, an average of more than 145,000 annually. It is probably safe to say that in 1923, fully 1,000,000 persons in the United States took vocational and occupational instruction by correspondence. In the face of this, Mr. Pound in the "Iron Man in Industry" says in confident and sweeping phrase, "We have less of vocational education than we did—for good reason, since its utility is passing." It is not too unkind to say that his statements on this point are no more sound than his declarations concerning the demands on the knowledge and intelligence of modern workers. Both amazing mistakes have been made by a sincere, brilliant writer, who apparently lacks knowledge of the real facts!

6. *The actual demand for vocational education.* The demand for vocational education has apparently been ignored by the proponents of training for culture only. Carrying a special brief for one form or aspect of education, they have been either unwilling or unable to sense the conditions in modern vocations which make vocational training more necessary than ever before; to realize the rapid growth and extent of the movement for practical education; or to appreciate the demand for it on the part of both employers and ambitious workers. This need for a system of vocational education in the United States is shown by public sanction and support, by the declarations of employers and of organized labor and by the rapid and continuous growth of both public and private vocational training throughout the country.

In a subsequent chapter on National Aid to Vocational Education, the numerous steps are fully described which the national government has, since the civil war, taken for the encouragement and support of vocational education carried on by the states. Every one of these numerous plans of cooperation and aid from the nation has been voluntarily ratified and accepted by every one of the states and none of them once entered upon have ever

been repudiated by either nation or state. Federal moneys for the support of agricultural, home economics and industrial education and for the training of teachers for these fields has been at least matched by state moneys and in most cases the state appropriations for the work greatly exceed the allotment received from the federal treasury. In more than forty of the forty-eight states, a complete system of vocational education has been established on a permanent basis.

All over America today, legislative sanction has been given to the use of public moneys for the training of boys and girls and men and women for agricultural, homemaking, commercial and industrial pursuits; and the administrative machinery has been established for the earnest promotion and improvement of the work. Most of the development in this new form of education has taken place in the last decade. No other new social or educational movement in the history of this or any other country has ever made such rapid progress or received such widespread and unqualified support from all social groups. If vocational education is a delusion then it is one of the greatest political, economic and educational delusions with which this democracy has ever been hypnotized!

Virtually every local, state and national association of employers and business men has gone on record as favoring the establishment and support of vocational training in the schools. They have supported everywhere federal and state legislation establishing such training. At least thirty national associations of employers supported by their constituent associations, both state and local, are now considering plans for the extensive development of training for the workers in the occupations these associations represent. A large part of the credit for the adoption of the National Vocational Act appropriating moneys to the states for vocational training belongs to Organized Labor, particularly to the American Federation of Labor, and in many of the states at least this same group of wage workers has been

equally active and potent in securing the acceptance by the states of federal cooperation and support for all forms of vocational training and the establishment of definite State Systems for the furtherance of the movement. Employers and labor differ widely in their ideas as to what vocational training is needed and how it can best be secured. They have, through their national organization at least, found common ground in a mutual belief that the workers of America have the need and the right to systematic training for their occupations at public expense. It is unthinkable that they, with their first hand knowledge of the conditions and requirements of employment, are also laboring under an amazing delusion.

Perhaps the most convincing evidence that education for employment is needed will be furnished by the figures that show the growth and present extent of vocational training in the country. Under the National Vocational Education Act, approved February, 1917, subsidies are given to the state by the Federal Government for the salaries of teachers of agricultural, trade, home economics and industrial subjects and for the training of teachers in these subjects. The total allotment to the states for these purposes began with \$1,500,000 in the first year and by a step rate performance increasing in amount each year, reached a total of \$7,000,000 in 1925-1926. The states and local communities provide plant, equipment, all other operating expenses and at least 50% of all salaries of such vocational teachers. With the aid of this help from the federal treasury, the states have rapidly developed what are commonly known as the Smith-Hughes Schools. Table No. 2 following shows the rapid increase in registration in them and therefore of the demand for this form of public instruction.

The total registration of 2,613,732 for a period of seven years represents an average of about 400,000 annually. Assuming each pupil attending instruction for the maximum of two years provided in almost all of these schools, this total registration of

TABLE No. 2

Vocational Schools Federally Aided—by Years, Number of Schools, Teachers and Pupils

(By years, number of schools, number of teachers, total enrollment)

<i>Years</i>	<i>Schools</i>	<i>Teachers</i>	<i>Enrollment</i>
1924	7,000	16,192	652,994
1923	5,700	14,458	536,524
1922	4,964	12,343	475,828
1921	3,877	10,066	324,247
1920	3,150	7,669	265,058
1919	2,039	6,252	194,895
1918	1,741	5,257	164,186
			<hr/> 2,613,732

2,613,732 when divided by two shows a total of more than 1,300,000 individual students attending instruction in these schools during the period. Of the total enrollment for 1923-24 shown above, 85,984 received agricultural training and 157,167 home economics training, while 409,843 were given instruction in trade and industrial subjects. In the same year, 193,674 attended evening extension courses while 459,320 received instruction during the daytime. Taking the registration for the first year, 1917-18, as a basis for comparison, Chart No. 1 following shows the comparative percentages of increase in enrollment by years for federally aided schools alone.

The shaded block shows for each year the number of students enrolled for 1917-18, the first year in which federal allotments were made for the support of approved vocational schools. The increase in registration for each year over the basic or beginning year is represented by the unshaded block for the corresponding year. An examination of the preceding table along with the Chart will establish these things: 1. In the short space of seven years, the numbers taking training have become more than four times as large as in the beginning year; 2. each year has witnessed a large percentage of increase in enrollment over all previous years; 3. with the exception of one year (1922) the latest year (1924) shows the largest increase in registration over the

preceding year, as well as in percentage of increase in registration. While the average increase in enrollment per year over 1917-18 has been 51%, that for 1924 was over 75%. These figures are given here somewhat in detail as a further answer to the amazing declaration of Mr. Pound. More amazing still be-

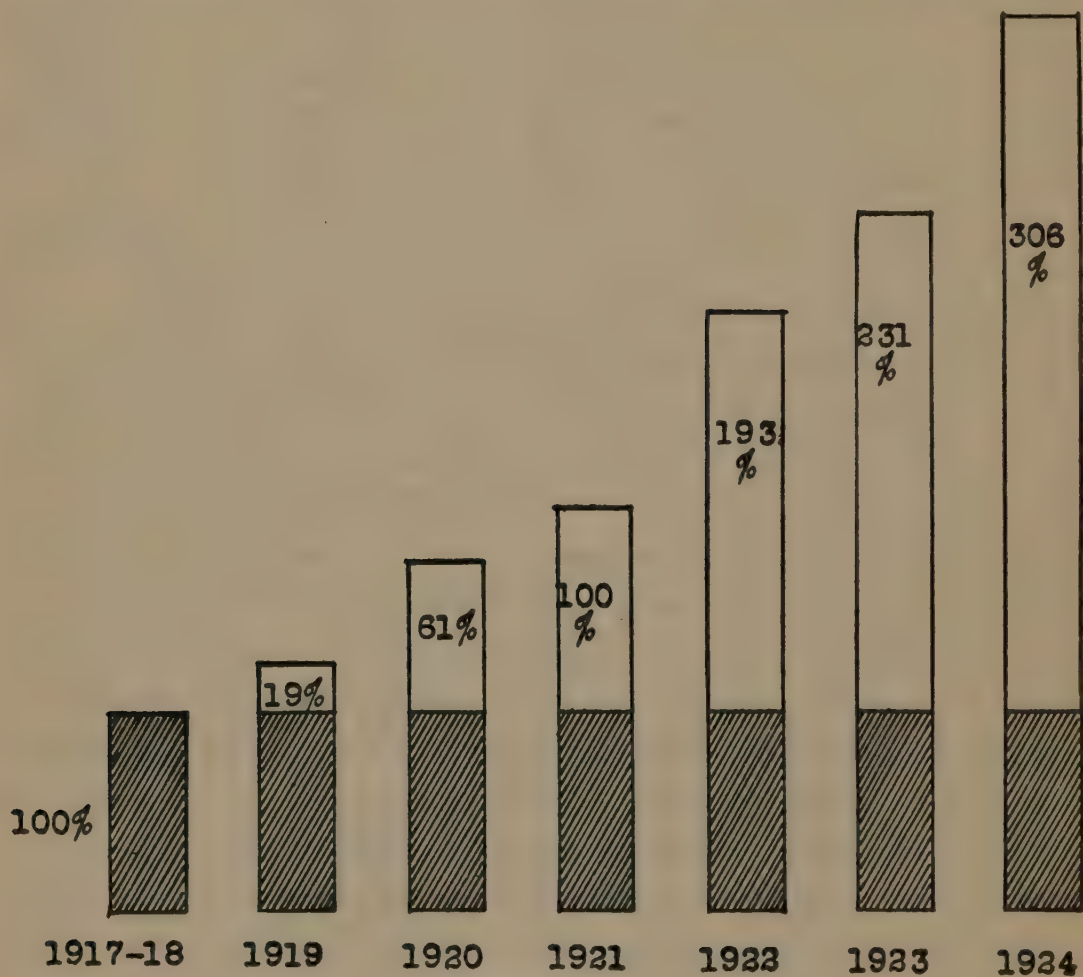


CHART No. 1

Showing Increase in Enrollment—Federally Aided Schools (1917-1924)

comes this sweeping statement when we attempt to picture the total amount of vocational education now going on in this country.

In addition to federally aided schools, the Bureau of Education gives the following approximate figures regarding Vocational Schools not federally aided (1919-20): Students in commercial

and business schools 356,000; in private high schools pursuing business courses, etc., 63,000; in public high schools, including Smith-Hughes students, 1,388,000. These figures take no account of the numbers enrolled in correspondence schools, a very conservative estimate of whom would be 1,000,000. Nor do they include those enrolled in private industrial and trade schools of all kinds of whom there are at least 50,000. Nor is any reference made to the corporation schools which in the year 1922 gave training to at least 25,000 employees. Nor do they include the extension work of the state agricultural colleges which in the same year gave instruction through field agents, short winter courses and correspondence to tens of thousands of persons already employed in agricultural pursuits. When we include all these groups we have a total of many more than 2,000,000 persons taking some form of practical or vocational instruction. If we omit agricultural, home economics and commercial education, there still remain at least 1,000,000 persons who are annually receiving training for trade and industrial employments. This number, which is increasing rapidly each year, is distributed somewhat as follows at the present time: In Smith-Hughes Schools 409,843; in private schools and classes (estimated) 50,000; in corporation schools (estimated) 25,000; in correspondence schools, more than 500,000.

According to the proponents of the policy of education for leisure only, this huge army of wage workers, present and prospective, are chasing a will-of-the-wisp when they give their time and their substance to training which is not necessary for their success and for which there is no longer any demand in industry because the iron man has made it unnecessary and impossible for workers to know or to think or to do!

Things Misinterpreted

Those who assail the proposal that workers be given an opportunity at public expense to secure what they require for success

in their occupations and for advancement in position and wage have, to judge by their public utterances, grievously misinterpreted the real conditions in the workers' world. One is justified in thinking that many of the exponents of education for culture only honestly believe that under the conditions of modern employment, industry has become an imbecile or at least most workers are either imbeciles or performing tasks fit only for imbeciles. After giving full weight to the vivid descriptions (advanced as Exhibit A) of the monotonous tasks performed by low grade workers, many of whom would be unemployable in any other than a machine age, the fact still remains that no previous age has established such high standards of efficiency for all occupations; required such a large body of functioning knowledge necessary to the efficient performance of occupations; offered such large opportunities of promotion to capable, well-equipped workmen; or made such demands upon the thinking intelligence of all workers, taken as a whole or on the average.

To many of these parlor reformers of the economic world, the typical industrial plant is one where a college-bred technician plans and executes work carried on by unthinking minds tending in a hopelessly dull and mechanical way a grim monster called, with a parlor gesture, the iron man. The typical industrial plant is one whose superintendent and foremen have risen through sheer force of ability and application from the ranks of the men whose work they direct. Many of the men under them have the same ambition to advance. From superintendent to beginner, worker and plant alike are suffering from the lack of the usable technical knowledge which is vital to the success of the plant but which the plant cannot give and no other agency has yet been provided to supply.

Apparently the champions of the idea of no education for work honestly believe that virtually every worker is harnessed to some one special job where he remains fixed all his days in one monotonous task. Tools and operations and processes and skills and

what functioning knowledge exists remain static and so does he! The truth is that in modern society the great majority of wage workers are just like the readers of this book—they change their jobs, not one time, but many times. Every time they change they need the help here called vocational education for the new task. “As a slave of the machine, he has no interest or pride in his work, no pleasure in doing his part well, no ambition to improve his service or his position, no plan or hope for the future.” Anyone who really knows the American wage earner knows this sweeping statement to be a piece of silly rhetoric. It needs no refutation here unless it be to point out the swelling enrollment of the vocational schools of the country.

“All these tragic things,” say the radical and the parlor philosophers, “have resulted from the ruthless hand that the iron man laid on a Golden Age where every worker was a craftsman who put his soul into the things he fashioned and shared with the High Gods in the creative spirit!” Apparently they are utterly blind to the fact that only a comparatively few workers were employed in the crafts; that the skill of the ordinary craftsman was almost entirely a manual dexterity developed by the continuous practice of a few standardized operations or processes; that the tools and materials he used were few and simple and fixed; that there was no body of technical knowledge such as science and discovery have contributed to every modern field of employment; and that there was little or no demand for the application of a well-equipped, thinking intelligence to complex and changing situations such as the successful modern worker must meet. Nor apparently do these worshipers of a mythical age see in the background of the craftsman they exalt, the pathetic figure of the typical worker of that age—the peasant, who, broken with long hours of monotonous employment, stirred the soil with crude tools and stared with unthinking eyes across the unfriendly glebe: a picture drawn for all time by Edward Markham in “The Man with the Hoe.”

Undoubtedly the opponents of vocational training have also misinterpreted its real social function. Its purpose should be not to supplant but to supplement general education. We believe for reasons set forth in the chapter on *The Discovery and Placing of Ability Through Training* that elementary courses in the practical arts are a necessary and valuable part of the general education of many youth. We do not believe, however, that any person should be advised or permitted to take real vocational training fitting him directly for some wage-earning employment until he no longer wants to be trained for more schooling but does want to be prepared definitely and thoroughly for some wage-earning employment. The saddest mistake which many well-meaning enthusiasts in the new movement have made has been the attempt to give the same students some sort of a course of instruction which will at one and the same time fit them for college and for immediate wage-earning. This plan has not worked and in the very nature of the problem cannot work. It always ends in a failure to accomplish both aims. Vocational training should follow, not accompany general education, and it should be built upon the largest foundation of general education which the youth is willing and able to lay before he undertakes training for an occupation or a pursuit. Once, however, he has entered upon this training, its controlling purpose should be to equip him for the work he wants to do. Only those vocational schools that have recognized this have been successful in their efforts to equip either the youth or the adult to meet the real demands of employment.

The social functions of vocational education is not primarily to add to the culture of any society, although as we have seen it does do this very distinctly as a by-product. (See the Chapter on *Vocational Education and Human Resources*.) Its primary purpose is the development of social wealth by conserving human resources. It conserves human resources by conserving human effort. It conserves human effort by reducing the period of

learning an occupation, by equipping the worker with functioning knowledge, by promoting job intelligence in the application of usable facts to situations and problems, and by stimulating the job morale of the worker.

These are in essence precisely the aims and claims of every professional course of college grade in the land. Are they not at least equally sound and desirable when they apply to millions of wage earners? Vocational schools have accomplished and are already accomplishing just these aims for great numbers of workers in every great field of employment. Why, then, laud the professional course and bitterly attack the vocational schools for farmers and mechanics and commercial workers and homemakers, as being undesirable, materialistic, unnecessary and sinister? It is not as important socially to discover and develop the vocational interests, aptitudes and possibilities of American citizens as to train them for leisure? If this be not done, whence is their leisure to come and how are they to acquire the means whereby to support it?

Why they ignore and misinterpret—The opponents of vocational education, as the term is here used at least, do not know the real facts about the worker's world and its demands and opportunities. Therefore, they are unintentionally blind to his needs and rights. They also have an equally false idea of what vocational education is. They think of it as confined to crafts and required only by crafts. They regard all training as training in craftsmanship. Since craftsmanship of all the old type has virtually disappeared, they see no further need for training.

Familiar only with "training" as confined to schools, they cannot visualize the need or the possibility of this service being performed by any other agency than the schools. Some of them can vision this service being done only by the public schools. Familiar only with the provisions for the full time training of youth before employment, they cannot think of any other agency for vocational education than the all day preparatory school

which they regard, and justly so, as an inadequate and futile device for the mass training of all workers for all occupations. Accustomed only to education which supplies information and not *training in doing*, they cannot regard systematic training on the job itself as educative. Familiar only with educational schemes completely controlled in all their phases by the traditional school, they cannot regard cooperative training arrangements between the school and the occupation as either feasible or educative. Because they have been accustomed only to cold storage education previous to employment, they have no understanding of or sympathy with direct short course extension training, giving applied knowledge for immediate use by those already employed.

Fundamentally, however, these advocates of education for culture only oppose the use of money or time on vocational education because of a deep seated belief in the saving grace of scholastic training. They took it and, let us say, liked it; ergo, everybody else must like it and must take it. They met its requirements; ergo, everybody else can do likewise and should be required to do likewise. They found this scholastic training a necessary means of qualifying for the professions they follow; ergo, so will everybody for every occupation. They have found this scholastic knowledge a social advantage in the scholastic circles in which they move; ergo, so will all others in all social circles. They have found, let us say, interest in scholastic subjects an avocation in life for hours of recreation; ergo, so will everybody else. They believe that, in some mysterious way, this scholastic knowledge, having no direct application to life, has been made to function in meeting real situations and problems in their lives; ergo, it will do this for everybody. They believe that the traditional use of abstract pseudo facts has developed their minds as nothing else would do; ergo, it will have this same effect on all other minds. They believe that, in some way equally mysterious, this standardized scholastic knowledge has devel-

oped in them and in others like them a superior personal character; ergo, it will do this for all others as well.

Because of the super value of this standardized scholastic teaching material, it must be preserved and vindicated at all hazards. It is the balm of Gilead for every weakness and the precious oil of Lebanon with which everyone must be anointed, and all attempts to modify its content or to substitute in its place knowledge having direct application to the problems of modern life must be exposed and condemned! This has been the attitude and the spirit with which the scholastic group in every civilization has resisted in every century every proposal to change the subject matter or the procedures of the schools. The mere statement of their assumptions constitutes in itself a sufficient refutation; further comment and proof every chapter of this book has furnished. Nor can the real situation be long obscured by dragging the iron man, like a red herring, across the trail!

Roosevelt's Creed—Over against such a narrow and bigoted conception of the meaning of life, the needs of society, and the purpose of education, vocational education presents the simple creed which, more than a quarter of a century ago, Theodore Roosevelt proposed to his compatriots and asked them to commit to memory: "I believe in the free public training of both the hands and the mind of every child born of woman. I believe that by the right training of men, we add to the wealth of the world. All wealth is the creation of man and he creates it only in proportion to the trained uses of the community; and the more men we train, the more wealth everyone may create."

Lincoln's Philosophy—Against the theory of training for leisure only, the greatest of our Presidents struck a body blow in his attack on what he called the "mudsill theory of education"—the theory which "assumed that labor and education are incompatible and any practicable combination of them impossible." Lincoln's educational philosophy summarized from an address

made two years before his inauguration is the philosophy underlying the whole movement for vocational education today:

"Educated people must labor. Otherwise, education itself would become a positive and intolerable evil. No country can sustain in idleness more than a small percentage of its numbers. The great majority must labor at something productive. From these premises the problem springs: 'How can labor and education be the most satisfactorily combined?'"

"By the 'mudsill' theory it is assumed that labor and education are incompatible, and any practical combination of them impossible. According to that theory, a blind horse upon a treadmill is a perfect illustration of what a laborer should be—all the better for being blind, that he could not kick understandingly. According to that theory, the education of laborers is not only useless but pernicious and dangerous. In fact, it is, in some sort, deemed a misfortune that laborers should have heads at all. Those same heads are regarded as explosive materials, only to be safely kept in damp places, as far as possible from that peculiar sort of fire which ignites them. A Yankee who could invent a strong-handed man without a head would receive the everlasting gratitude of the 'mudsill' advocates. . . .

"As each man has one mouth to be fed, and one pair of hands to furnish food, it was probably intended that that particular pair of hands should feed that particular mouth—that each head is the natural guardian, director, and protector of the hands and mouth inseparably connected with it; and that being so, every head should be cultivated and improved by whatever will add to its capacity for performing its charge."

The proposed panacea—The proposed panacea is to fit a standardized human being for a fixed and standardized social job by the use of standardized school courses, standardized methods and standardized procedure. These will not only equip everyone, whatever may be his ability, his aptitudes, his interests or his opportunities, to meet all the demands for the social job, however

complex it may become, but it will also train him for the proper enjoyment of his leisure, at least for the use of his leisure in the way that the scholastics enjoy it, and think all others should likewise.

No one combats the vital necessity that everyone should be trained for the enjoyment of his leisure. As a matter of fact, people do in some way, either through their work in school or their experience in life, learn to enjoy their leisure. We may not agree always with the forms this enjoyment takes. It certainly takes many different forms. Many of these are entirely desirable, but do not receive the approval of the scholastics. Many of them have nothing to do with one's school life at all. Only a few spend their leisure hours in a standardized way prescribed by the academics. Man is a many sided human being. He passes through widely differing experiences. He has widely differing interests, aptitudes and environments. Since we are not all built alike, we do not all enjoy our leisure in the same way.

If it be assumed that the purpose of education is to train all to enjoy their leisure in the same way, then the schools have failed. If it be assumed that the purpose of the schools is to prepare everyone to spend his leisure in a standardized reading and reflecting way, then the schools are a failure. Any plan for the control of the leisure of people will not work. It has not worked and nobody knows how to make it work. It is a thing which could not be controlled anyway. How far away we are from the real situation may be indicated by asking one question: "What are the standards as to what constitutes the proper enjoyment of leisure?"

This year more than a million persons are spending their time after working hours taking training for employment, by mail. Is this an approved use of leisure time? Every week at least 5,000,000 readers enjoy the Saturday Evening Post. Does this constitute a proper way to spend their leisure? About two and a half million tired business men give at least two after-

noons each week to golf during the playing season. What about this way of using one's margin of time? There are said to be some 20,000,000 radio fans in the United States. Are they doing the proper thing with their idle hours? Probably a million amateurs are interested in the mechanical scientific side of this new miracle and are spending every available period in building or experimenting with receiving sets. Is this a satisfactory avenue for the employment of leisure? Doubtless a half million will this year read the novels of Harold Bell Wright. Should they be encouraged or discouraged from doing this? Which would be the answer if they proposed to read "Comus" or "The Flight of the Tartar Tribe" or the "Sir Roger De Coverley Papers"? And which, if they preferred Laura Jean Libbey or Sabatini or Marie Corelli? More than 100,000,000 fans paid admission to ball games last summer and about 20,000,000 attended moving picture shows last week to see Charlie Chaplin, Bill Hart, Doug, Mary, Valentino and the like. Was this socially desirable? Judging by the number of patent office inquiries and applications, at least 50,000 men are every year desperately engaged in the attempt to produce new inventions. Is this a good use of their time and strength? What about dancing and the theater and auction bridge and the automobile and camping and swimming and fishing and hunting and touring?

The illustrations just given show that there is no difficulty for most people to find a variety of ways in which to enjoy their leisure hours and that most of these ways are entirely innocent and wholesome. What is the kind of use of leisure hours which the academic would secure by training the masses for their enjoyment and how is this program to be made to function among a many sided people in the many sided environment of a free democracy? Are they all to read Shakespeare and Milton? Commune with philosophers? Thrill with the technical excellence of master painters and sculptors? Compose sonnets? Acquire a prose style? Study nature? Delve into history? Learn to play chess instead of auction? Substitute Classic Greek dances for

those now in vogue? We venture to suggest that the regular school will have accomplished most for the leisure hours of wage earning boys and girls if it gives each of them a genuine interest and pleasure in reading wholesome if simple things; an enthusiasm for some form or forms of wholesome recreations; and some deep rooted hobby they can ride, if need be, booted and spurred all the days of their life!

Conclusion

Leisure depends on wealth. This is equally true of the individual and of society. Social wealth depends upon the intelligent application of human to natural resources and therefore upon the development of human resources and their effective use. Human intelligence has produced the iron man, and human intelligence properly trained and directed has used him effectively, and will always be necessary to use him effectively. The iron man, sired, fostered and manipulated by human intelligence, has created the social wealth of modern times. Leisure is his creature. No iron man, no production, no wealth, no leisure. The theory of all education for leisure and no education for work is not true anyhow. Certainly its conclusions and deductions regarding industry and the needs of its workers are based on insufficient data, to say the least. More regrettable still, they are founded on some most amazing misinterpretations of vital factors from the real nature of modern employment to the high demands they make upon the knowledge and resourceful thinking of great bodies of wage earners.

This, at least, can be said in conclusion. No one can predict what the future will be 1,000 years from now; but the nation which during the next 100 years goes on the theory that its human resources of discovery and invention and skill and trained intelligence are not to be developed will lose both wealth and leisure. In losing these, our own country would also lose its proud place among the forward looking nations of the world.

QUESTIONS AND POINTS FOR DISCUSSION

1. Make a list of all the labor saving devices found in the typical American home. Has their introduction increased or decreased the need for practical knowledge and job intelligence on the part of wives, daughters and servants? Why?
2. Make another list containing all the practical uses of science which are now available for the comfort and safety of the home. Has their discovery and application increased or decreased the need for practical knowledge and job intelligence on the part of those employed in the home? Contrast this situation with that of the pioneer home.
3. What has been the effect of the discovery and invention of scientific knowledge and labor saving devices upon standards of efficiency in the performance of home duties? How has this affected the need for skill on the part of home workers? Their need for knowledge? Their need for resourceful thinking? Their need for training?
4. Make as complete a list as possible of the labor saving devices which have been made available to the modern farmer. Has their introduction increased or decreased his need for practical knowledge and job intelligence?
5. Make as large a list as possible of the practical uses of science which are now available for agriculture. Have their discovery and application increased or decreased the need for knowledge and intelligence on the part of those engaged in farming? Contrast this situation with that of the farmer of our pioneer period.
6. What has been the effect upon standards of efficiency in agriculture of labor saving devices, scientific knowledge and large scale production? How has this affected the need for skill? Is it the same skill as that required in pioneer days? Is it a greater or less degree of skill?
7. How have the improved standards of efficiency in agriculture affected the farmers' need for practical knowledge? For resourceful intelligence? For training?
8. Make a list of ten simple occupations in the pre-machine age, such as oxcart driver, lamp lighter, shoemaker and the like. Trace the evolution of each due to the application of labor saving devices and give all the current occupations you can which have developed from each of these ancient employments. Contrast each primitive occupation with its corresponding modern occupation from the standpoint of skill, knowledge, resourceful thinking and need of training.

9. The next time you ride through city streets on a trolley car or with a taxi driver or drive your own car or ride with a friend, think of the driver of a one-horse delivery wagon traveling through the streets of a small town in 1860. Contrast the demands made on him with those now made on the motorman or auto driver as to skill, practical knowledge, job intelligence and need for training. Carry this farther by making the same kind of comparisons between those workers who repaired and adjusted the delivery wagon and those who now keep the trolley car or the auto in running condition. Make the same kind of comparisons between those who produced the wagon and those who now produce trolley car or auto.
10. What classics did you study while in high school or in college as preparation for the better enjoyment of your leisure hours? How many times have you re-read them since leaving school? Why?
11. If you could control the leisure time of all the people of this country, how would you have them use it?
12. Since they would have to be prepared for the intelligent use of their leisure time, in the way you prescribed, how would you train them for this duty or opportunity?
13. What application does the old adage "You can lead a horse to water but you cannot make him drink" have to the problems of education and leisure and work?
14. Debate this statement: The progress of discovery and invention will culminate in a Society where all jobs will be specialized tasks performed by automatic machines tended mechanically by unthinking workers harnessed to enervating tasks and relieved only by the longer hours of leisure, which the iron man will make possible and which a compulsory, full time, standardized, cultural education up to twenty-one years of age will equip each of them to enjoy.

BIBLIOGRAPHY

The Iron Man in Industry. Arthur Pound. The Atlantic Monthly Press, Boston.

Published first as a series of articles in the "Atlantic Monthly" which attracted widespread attention. Pictures the profound and sweeping changes which the progress of labor saving devices and the specialization of tasks have caused in every aspect of modern life, particularly in America. An earnest and brilliant exposition of the training for leisure only theory in education.

R. U. R. Rossum's Universal Robots. Karel Capek. Doubleday, Page & Company, New York.

A fantastic melodrama that "begins as an extraordinary searching study of human life and human society and ends as a most brilliant satire on our mechanized civilization." Presents the extreme view of those who believe that the iron man is rapidly turning man into an automaton.

An Introduction to Social Ethics. John M. Mecklin. Harcourt, Brace & Company, New York.

A most able study of the whole subject containing chapters which discuss in a dispassionate way The Philosophy of the Machine and The Worker and The Machine Process.

Citizens in Industry. C. R. Henderson. D. Appleton & Company, New York.

An extensive bibliography on the subject of the development of mechanism and its social and economic effect is given on page 329ff.

The Social Unrest. J. G. Brooks. The Macmillan Company, New York.

Chapter 6 discusses, as a conflict, Man and Society versus Machinery.

Principles of Scientific Management. F. W. Taylor. Harper & Brothers, New York.

Contains a defense of the specialization of tasks in modern industry. Suggests scientific methods for increasing production and conserving the worker. Defends the proposition that modern industry has made it possible to utilize low grade workers at living wage and maintains that such workers are interested in the performance of their jobs and in the team play of modern production.

Instincts in Industry. Ordway Tead. Houghton Mifflin Company, Boston.

The Instinct of Workmanship. T. Veblen. B. W. Huebsch, New York.

Annual Reports Federal Board for Vocational Education, 1918 and 1924. Government Printing Office.

These give in detail the figures showing the remarkable development in industrial, agricultural and home economics education between these years. They also give reports from the various States describing the progress made in the work and the problems to be solved.

Annual Report United States Bureau of Education, 1918 and 1924. Government Printing Office.

These give a synopsis of the progress in Federally Aided Vocational Schools. Chiefly valuable, however, as showing the advance in schools and classes not federally aided giving instruction in the mechanical, industrial and agricultural arts.

Annual Reports United States Department of Agriculture. Extension Division, 1918 and 1924. Government Printing Office.

Show the extensive development which has taken place in extension training for farmers through county agents, short winter courses and correspondence instruction publications of all kinds.

CHAPTER V

THE DISCOVERY AND PLACING OF ABILITY—BY TESTING

The effective utilization of human resources—In an ideal condition of society, everyone would do the work for which he was best fitted and do it in the most efficient way. This would be a perfect or 100% use of human resources, a social ideal probably never to be attained. More or less consciously, however, we are working toward this as a goal.

This task of conserving human effort is performed largely in proportion as four ends are accomplished:

1. Fitness or native ability for different vocations or occupations is discovered for every person.
2. Every person is placed in an employment in which his ability can be used to the best advantage.
3. The ability of every person is trained for the line of work for which it is best adapted.
4. Every employment is so organized and conducted as to use the trained ability of every person in the way that will secure maximum results with the least expenditure of time, material and effort.

In this chapter the first two of the foregoing factors are discussed, while a succeeding chapter deals with the training and direction of fitness or ability.

All our experience goes to show that in the field of economic production we have a multitude of different jobs widely different in character. Each of these jobs presents certain requirements. In more technical language, each job consists of a group of operating points or demands which must somehow be covered or

met. In practice these points are covered partly by the man and partly by the tool or machine. With the linotype machine, for example, there are certain things which the machine must do, but it can only do these properly when certain other so-called "human operating points" are performed or "covered" intelligently by the operator. In order successfully to cover the human operating points on different jobs, different abilities are required. This is true of the most ordinary employments. The ability to meet the demands of these human operating points on a "pick and shovel job" are just as distinct and concrete as those required to cover corresponding points on jobs in what would commonly be regarded as high grade occupations or trades.

Misconceptions as to job requirements revealed by job analysis—The use of methods of analysis in the study of occupations has shown that many jobs assumed to be unskilled or semi-skilled really make very large and definite demands upon the worker. A good illustration of this is furnished by a recent analysis of the position of night watchman in a certain factory. This had been assumed to be the kind of a job that required no special ability. Therefore it could be done properly by almost anyone willing to work for small wages. The analysis showed, however, that this man had the responsibility of protecting over a million dollars' worth of property from fire and theft and other hazards. Indeed, the detailed list of responsibilities developed by the study was startling. It showed that the proper performance of this task was of much more importance to the company, and required a higher grade of initiative, intelligence and ability, than had been assumed. In fact, the real requirements were higher than those for many positions in the plant paying a considerably higher wage and therefore presumed to demand a much more competent individual. A study of the important duties of a city patrolman under the police department of any city would probably only intensify the same general truth.

Variations in the ability of different individuals to meet job

demands—Granting that jobs make specific demands, it is equally true, on the other hand, that individuals, because of their widely differing capacities to profit by training, vary much more than has usually been assumed in their ability to meet these demands to the maximum. Probably the failure to realize this has been one of the greatest causes of concealed overhead, those items of cost in a business which are always present but difficult to estimate. Any agency, therefore, which could discover at an early date the fitness or the unfitness of an individual to meet the maximum demands of any job or to profit effectively by training for it, would serve a very direct purpose in the conserving of human resources. This would be sure to result in the better choice of a vocation by the individual and in the better direction of individuals into the kind of employment and training by which they could best capitalize their assets and therefore best use their economic efforts.

Discovering fitness—We have no means of finding the number of people in any modern society engaged in employment for which they are naturally best adapted, nor the extent to which they are employed at occupations for which they have the least or little capacity. All experience shows the world to be full of misfits. This is not at all surprising when we consider the way in which most workers find or choose, if such it may be called, their means of livelihood.

In the freedom of aspiration afforded by a modern democracy, a youth before the close of his adolescent years gives his temporary interest and bounding imagination free play in the selection of the calling he wants to follow—a selection that runs the whole gamut of occupations that have caught his fancy or stirred his ambition, from hunter to aviator and from alderman to President. In none of this tentative ordering of his future is he bothered by any considerations as to his ability to pursue the calling to which, for the moment, he aspires. When he leaves school to go to work, however, he faces a real and not an imagi-

nary situation. In the overwhelming majority of cases, the lack of any prevocational or vocational training has prevented him from learning what he can do or from securing any equipment for doing it. He is not particularly prepared to do anything but must do something.

As a result he usually goes to work at the first job that presents itself. This comes to him not by choice but usually by chance. Indeed, the instances are so rare of the wage-working youth who from his early boyhood dreamed and planned his way into the occupation he was determined to follow that they become matters of neighborhood wonder as well as material for story books. If he has any aptitude for his first line of work and likes it, he may remain in it, finding his level as time goes on according to his ability and ambition. If he does not like his employment or is not successful in it, he loses it or shifts to some other line where he usually gets a job in about the same way he secured his first one. Most youth in these days shift their employment many times before they reach their majority.

The social loss in the "wasted years"—This method of finding what you are best fitted to do is probably the surest of all. Roughly speaking there is no escape from the verdict of a performance test on the real job itself. Proficiency in an occupation is the surest measure of fitness for it. The best way from the standpoint of fair and accurate testing to find whether you can or cannot make a success of a given employment is to try it and see. Why, then, are the years of shifting employment between the close of full time school attendance for the youth and the date on which he finds, if he ever finds, the right job, called "wasted years?"

.It is because the method in practice is so crude in its operation and so wasteful in its processes as to constitute a costly haphazard plan of discovering the capacity and the proper employment for millions of youth. Society is operating on a gigantic scale a system of prevocational experience for working

boys and girls at a tremendous social cost. It may well be called the "pick up method"—the "trial and error method" or the "cut and try method" of enabling an individual to learn what assets he possesses and how these may best be used in the conservation of natural resources. The overhead cost of poor work, reduced production, damaged machines, spoiled goods and a huge labor turnover are past calculation. Even if the real vocational guidance or finding results were superior, the plan, if such it may be called, or, more accurately, the absence of plan is socially inefficient because its cost reveals an inexcusable waste of time and money.

Entirely aside from the effects upon production costs of this haphazard and chaotic way of testing a youth, or rather, of having the youth test himself, in the requirements of modern industry, the results are equally tragic from the standpoint of the conservation of human resources. For literally millions of people the experience means unnecessarily low wage for repeated trial periods in a succession of new jobs, loss of confidence in their own abilities, confused thinking about life and work, misdirected effort, thwarted hopes, lack of ambition and aimless drifting into the wrong job for life. Bad as is the economic effect upon them with its resulting lowered standards of living, the direct anti-social effect must be even greater!

Various schemes have been proposed for securing a more efficient way to place people in the work for which they are best adapted, ranging all the way from furnishing the youth vocational information and advisement before he leaves school to the use of various kinds of tests for determining what are his abilities and aptitudes. All of these have for their purpose the reduction of the huge cost of our present wasteful social machinery for securing workers of every kind and grade. In general all of these schemes may be classified, according to the method employed, as testing or training.

Testing as a means of discovery—The recent development of mental tests and of special occupational tests for special apti-

tudes naturally raises the question as to how far they can be substituted for job try outs. It will not be possible here to enter into any detailed discussion of the various kinds of tests that have been developed, but only to indicate in a general way what they are and how far they will probably serve to discover fitness for different employments.

The test for general intelligence—The test for general intelligence, or intelligence tests, as they are called, are designed to measure only the natural, or native or “intrinsic” capacity of the individual, which he received, let us say, by heredity from his ancestors, but which, however derived, he actually possesses. Each test, known by the name of its author or inventor, is a more or less ingenious collection and arrangement of common racial experiences of various kinds to the major portion of which at least every person measured has been exposed. His answers or reactions to the questions asked about these experiences furnish, when evaluated and calculated, the index or measure of his mental alertness or ability to handle facts known as his intelligence quotient or I.Q.

Any individual with an I.Q. of 70 for example is said to have a low level of ability, one having an I.Q. of 120 is said to possess a high grade of intelligence; while a rating of 160 would indicate an exceptional mind. To the extent to which any such test does subject the minds measured by it to thinking about experiences common to every mind, it furnishes a reliable and comparative picture of the intrinsic ability of each. This is all that it can do and all that its inventors have ever claimed that it is able to do.

If we can assume a job making no other demands for success than a high level of intellectual ability, then the person having the highest I.Q. should be selected for it. An analysis of any occupation, however, demands as a condition of real success:—

1. A certain minimum grade of intrinsic intelligence which, in some occupations, is low, as in ditch digging, and in others is very high, as in law or medicine or engineering.

2. A certain minimum amount of different kinds and grades of special aptitudes, such as manual dexterity, quick reaction time, muscular control, precision, etc. In some occupations the demand for any of these may be very low or even zero, as in the case of the physical abilities of the minister, or very high as in the case of the manual dexterity of the telephone operator.
3. A certain minimum amount of personal qualifications for different occupations, such as health, strength, personal appearance, initiative, tact, industry, honesty, truthfulness, interest in the work, general morale, etc. In many occupations, such as banking, some of these are held more important than a high intelligence rating.

Intelligence test does not indicate special assets—The results of any standard intelligence test might give valuable information about the grade of mind possessed by the applicant, but it would in no way indicate the presence or absence of the special mental and personal traits just described, which come into play in meeting the demands of any specific job. Such a test might show whether its owner had a good mental machine, but would in no way indicate how that machine would function in meeting all the demands of law, or carpentry, or theology, or selling bonds.

Since most, if not all, occupations call for aptitudes and personal qualifications which cannot be measured by any general intelligence test and since employers have come to recognize that these special assets play even a greater part in the efficiency of ordinary men in most occupations than exceptional ability, it seems clear that this kind of test will not be relied upon by them as the chief or sole device in selecting employees for most occupations. A very clear illustration of the truth of this statement would be furnished if one were asked to determine what occupation a given youth, 16 years of age, should be advised to follow, and were given no other information about the case than that he

had shown on a standard test an intelligence quotient of 120, which indicates that he has a rather high level of native ability.

The use of intelligence tests in vocational advisement has so far been of a general and what might be called negative character. Undoubtedly they do furnish at least a roughly accurate measure of the mental capacity of the youth to deal with certain kinds of human experience. Broadly speaking, this capacity changes but little, if at all, throughout life after he reaches his mental maturity which usually occurs about the age of 16. In the case of any person this index, once gained, can be used at least to determine the kind or grade of occupations which he cannot follow, because they require for efficient service a higher level of intelligence than he possesses.

The son of ambitious parents who has a low intelligence rating can never meet successfully the mental requirements for the professions of law or medicine or engineering or teaching or theology in any of their branches. This is a clear cut case because the scholastic technical education for these callings now enforced by law or by custom make demands that he cannot meet. Moreover, the thinking intelligence required for these professions is apparently of the kind and grade which only those possess or are assumed to possess who have survived the school course of training. This training is now virtually standardized from coast to coast and, to a very great extent, so is the performance of the work itself. Nevertheless a very high percentage of those who do survive the training required, fail in the profession itself; this is especially true in the case of medicine.

Consequently, a competent adviser could assume and advise that a youth with a low I.Q. was not competent for any profession, but he could not predict or assume that another youth having a high level of intelligence would succeed in all professions or even in a given profession, not, at least, without knowing more about both the profession and the characteristics of the

youth. All that could be safely said would be that he had the necessary native ability.

Intelligence tests and occupations—When we attempt, however, to use intelligence tests for advising the great mass of our youth concerning a vast array of occupations below these standardized professions we encounter a maze of difficulties and are in danger of being led into grave absurdities. Almost all of these employments, considered from a national point of view at least, have neither standardized name, operations, processes, or demands, nor have they any minimum standards of proficiency in the performance of the work that are either defined or enforced. As a result naturally to be expected, most of them provide no systematic training and none of them has established on a country wide basis a standardized course of training.

All the features which might enable an adviser to predict that the I.Q. of the youth did or did not indicate the ability to pursue a recognized profession are absent in this chaotic situation so characteristic of employments in every line of industrial, commercial and agricultural activity. "Carpenter," as reported in the Census reports and in the Army Mental Tests, may mean and does mean many things, and therefore for purposes of measuring the mental capacity required for the efficient pursuit of the "occupation of carpentry" means nothing as to what he does or how well he does it. Anyone at all familiar with the situation knows this to be true of "electricians," "machinists," "auto repair men," "clerks," "farmers" and virtually all the rest.

The "Alpha" and "Beta" Tests—During the war a group of eminent psychologists devised some tests of intelligence for army purposes known as the Alpha test for literates, and the Beta test for illiterates. With these the index of intrinsic intelligence was found for each of about 140,000 enlisted men reporting themselves as coming from a great number of different civilian occupations. Lately studies have been published giving among other most excellent data a classification of these men by occupational groups with the range of intelligence and even the average and

median level of intelligence for each group. Speaking for these psychologists, Yoakem and Yerkes in their book on "Army Mental Tests" caution the reader that the army group test was not prepared for civilian use and is applicable only within certain limits to other uses than that for which it was provided. They also give twelve reasons to indicate this limited applicability.

Nevertheless, carried away by the undoubted excellence of these studies and particularly by their impressive statistical data concerning the comparative levels of intelligence found in different civilian occupations, some have seriously proposed that the averages or ranges of I.Q. for each occupation reported be accepted as the norm or index of native ability required for its successful pursuit. Once accepted, these proponents say, it would be easy to decide at least that the youth having a given I.Q. could or could not follow this or that occupation successfully. Some have gone so far as to propose that every youth be advised to take up the particular occupation whose norm of required intelligence shown by these army tests agreed most closely with his own level of intelligence as recorded by a similar test.

Entirely aside from any question concerning the tests themselves or the degree to which they can be used effectively for civilian purposes, the proposal becomes preposterous when we realize that most of the occupations classified are chaotic instead of uniform in their demands upon workers, and therefore are utterly incapable of being studied as standardized employments. The tests certainly cannot be used to find the level of intelligence required for any employment by a study of the I.Q. of soldiers from every section of the country on the assumption that each has been performing the same processes and operations in the same way and meeting satisfactorily the same demands as to proficiency. The experts who devised and directed the army tests will readily agree with this statement.¹

The value of the intelligence test in selecting occupational

¹ Army Mental Tests, page 2. Yoakem and Yerkes. Henry Holt and Company.

workers—From the foregoing discussion it seems clear that the intelligence level of workers in any occupation will be reliable as a measure of the grade of ability required for success in it only in proportion as these conditions are met, none of which were present in the army tests:

1. Each occupation must have a standardized name describing a standardized set of operations and processes.
2. It must be organized and conducted so that the work to be done makes the same demands upon the intelligence of each worker.
3. It must recognize and enforce minimum standards of efficiency in meeting these demands.
4. The workers tested must have been successfully employed in the occupation showing that they have the requisite capacity for it.

This being true it is obviously impossible to devise and use for vocational advisement any national standards or level of intelligence for any occupation except possibly, for reasons already given, a few professions. It will always be impossible with most occupations because the time will never come when they will meet all the conditions just described. Admittedly, the grade or range of native ability required could be determined for a local plant by a study of the intelligence quotients of its workers, but only after this plant had first met the foregoing conditions. It might also be done by testing recognized successful workers. This norm of required ability would serve only to eliminate those not possessing it, but not to choose those who should follow the occupation.

Consequently, it seems safe to say that the general intelligence tests are to have extensive use only in general education and in determining the capacity of a youth to take the training required for some occupation. Where high native ability comes to be recognized as indispensable for any occupation, the I. Q. of

applicants will increasingly be used as a guiding and selective factor. Beyond these uses, however, we may expect improvement in the present methods of selecting employees through the use of special occupational tests and trade tests because they may be made to reveal not only ability but other necessary qualities and assets.

Special occupational or entrance tests—Quite independent of these intelligence tests there seems to be considerable evidence that measurements can be developed which will show whether an individual is likely to be a success on a given job. Such tests must, of course, be different for every job. Job analysis can readily be made to reveal the human operating points and the demands of each of these on the worker as to aptitudes or traits or other special assets required. Such an analysis might show that a competent telephone operator should have a pleasing voice, good health, steady nerves, genial disposition, a good verbal memory, keen eyesight, quick reaction time and precision. Tests are already available to measure most of these assets.

By such use of measurements of occupational requirements, tests can be made of large service in the better selection of workers for employment, but only when they are worked out in cooperation between the practical man and the psychologist and have been subjected to the process known as the testing of the test. This is most frequently done by having the workers already employed on the job ranked by the foreman as to their proficiency in the work and then having them take the proper test. When the rankings on this test and the rankings made by the foreman show a high correlation, the presumption is established tentatively that the selection of applicants for this job by the use of this entrance test will be more effective in getting competent workers than the usual method of interviewing and inspecting them. Should the rankings of new workers, when made later by the foreman, show somewhat the same correlation with their ranks on this entrance test, it is then adopted for use.

So far as most production employments are concerned at least, these occupational tests are of value in choosing workers largely in proportion as the job is specialized and narrow in its demands. This is particularly true where the human operating points on any job make recognized demands on certain necessary and definite mental and physical aptitudes capable of being measured, but do not call for such special assets as personal appearance, honesty and tact, which are not, as yet, at least, capable of being measured. In other words, special occupational tests are much more likely to serve well where the requirements as to item number two, as given above, are large, but small as to item number three. They could be used to select girls for specialized jobs in a toy factory, but they are not likely, for the same reasons, to be of any large service in determining the fitness of individuals for executive positions where the degree of intelligence, initiative and dependability is high. They might serve excellently to choose girls to load shells in an ammunition factor, but not to choose the President of a railroad system. When we come to those jobs where personal qualifications as distinguished from level of native ability or special aptitude count most, mental tests will probably be of little or no avail. You cannot measure honesty or truthfulness or geniality or magnetism or diplomacy or executive capacity. Here both adviser and employer must for the present at least fall back upon judgments formed through personal interviews and the evidence furnished by credentials—a situation that offers wide opportunity for the phrenologist, the hypnotist, the character analyst and the charlatan!

Trade tests—Trade tests, as distinguished from special occupational tests for beginners, are used to show what a man knows or can do in an occupation in which he has had some experience. The simplest form of this occurs when an applicant for a job is given a real piece of work to do which requires the skill and knowledge he claims to possess. The object is to determine either whether he should be employed or where he can be used to the

best advantage. In order to save the cost in time and material of this method, however, there has been developed what may be called the trade test for different trades and occupations.

By ingenious questioning this brings out a man's familiarity with the tools, processes and shop knowledge for his line. In general such tests are an attempt to substitute a quicker and therefore less expensive method for actual work on the job. They are usually employed for dealing with a considerable number of applicants for the same position, largely because the conditions of production in the plant will not permit the use of equipment for a tryout on the job. During the war, however, they came into considerable use by the army and the navy. Here they were developed for a large number of civilian employments which required the same kind of knowledge and skills needed for similar occupations in different branches of the service and for which men in large numbers must be quickly selected and assigned to duty.

Undoubtedly a special tryout on the job under inspection is the surest way to discover a man's efficiency and fitness and the best to use with small numbers and infrequent hiring and firing. When large numbers or plant conditions prevent this, the trade test is a far more effective device than the present crude and ultimately costly plan followed by most employers, of hiring so-called tradesmen or experienced men on their own claims; or on written credentials carried by the applicant; or on the evidence furnished by references; or on the basis of a personal interview; or by snap judgment; or by the method of trial and error. The enormous labor turnover of most large concerns bears eloquent testimony as to the results of "hiring in haste and repenting at leisure." All the foregoing could be said with even greater truth about the failure to use the special occupational or entrance tests in selecting beginners for many employments.

Personal interviews and credentials are also forms of testing applicants for positions. For the great mass of unskilled and

low grade skilled workers these devices are seldom used. When used, they usually become a hasty casual inspection ending in an immediate snap judgment on the case. As the importance of the job increases, the length and character of the interview advances. Credentials are also required which may range through a wide variety of written information, such as, the filling out of an application blank, the testimony of previous employers and even the filing of evidence concerning previous accomplishments. In some form, interviews or credentials or both constitute the method by which most workers are selected today where any attempt is made to investigate before employment.

Value of the trade test—Because of the many personal elements and contingencies involved in the contacts of interviewer and candidate and those who give evidence concerning him, this method at its best can never be scientific. It does not attempt to measure accurately but only to provide facts and impressions for use in passing judgment upon the qualifications of the applicant. It is precisely this human element in the method which makes it the most feasible way to determine the personality assets of the applicant, since these cannot be measured accurately but must be arrived at through sound reasoning regarding facts and impressions that comes only from long experience in judging and checking up men. There is no I.Q. for honesty or tact and no special occupational test for human leadership. Consequently, the interview and the credential will continue to be the method for studying the personality of candidates for positions in which character, conduct, and qualities of leadership or organizing capacity are of great importance, such as honesty in bank clerks, tact in salesmen and the ability to handle men in all kinds of executive positions.

This method will persist for the discovery of such assets in applicants not because it is accurate and reliable in its results, but because it is the only kind of test which provides any tangible

evidence concerning intricate and complex personal traits which reveal themselves, not by answering questions but by conduct and personal appearance and bearing. In the hands of an unaccomplished or inexperienced examiner the personal and impressionistic character of the test is sure to result in costly mistakes and grievous injustice. Any kind of test or tests which would reveal these same traits in an impersonal and quantitative way would be far better. Unfortunately they do not exist.

All experience has shown, however, that they do exist for measuring intrinsic intelligence; for the discovery and evaluation of special mental and physical aptitudes; and for checking the claims of men as to the real skill and knowledge they possess as the result of previous experience or training in the performance of the work of specific occupations or trades. This is the reason that in large corporations the interview and the credential is supplemented where needed by the intelligence test to some extent, and to a gratifyingly increasing extent by special occupational tests for beginners and trade tests for applicants having previous experience.

Summary—The foregoing discussion is summarized in the following table making comparisons between different tests or ways of discovering fitness for employments. In this table the value of these tests for different purposes is shown by the use of letters in a descending order beginning with A. In like manner the value for reducing the cost of judging the applicant is represented. Where a test has no value for any purpose, this is indicated by a corresponding blank space. In item No. 10, the three scientific tests are all graded A as time saving devices when compared with the time required for interviews and credential work. No attempt is made to distinguish between the time requirements for giving these three tests and "interviews and credentials" are rated as D to indicate that this test falls below the other three as a real time saving device. This applies at once to item No. 11.

TABLE No. 3

Rating Efficiency of Different Tests for Selecting Employees

<i>Things To Be Tested</i>	<i>Intell. Tests for—</i>	<i>Special Occ. Tests for—</i>	<i>Trade Tests for—</i>	<i>Interviews and Creden- tials for—</i>
<i>Item</i>	<i>All Applicants</i>	<i>All Beginners</i>	<i>Exper. Workers</i>	<i>All Applicants</i>
1. Native ability — grade of	A	D	C	B
2. Personal character, honesty, truthfulness, ethics, etc.				A
3. Personality—assets in appearance, tact, geniality				A
4. Exec. ability—leadership qualities				A
5. Exec. ability — for planning and executing plans	B			A
6. Manipulative skill used in a specific occupation			A	B
7. Technical knowledge used in a specific occupation			A	B
8. Spec. mental aptitudes for a specific occupation—quick reaction time, muscular control, precision, keen eyesight		A		B
9. Special physical assets for a specific occupation—health, strength—height—length of arm, etc.		A		B
<i>Social Cost and Value of Tests</i>				
10. Time required to make test properly....	A	A	A	D
11. Cost to employers of making test properly..	A	A	A	D
12. Reliability of conclusions for use.....	C	B	A	D
13. Justice to applicants..	C	B	A	D

In rating the intelligence test as B for determining executive ability in planning and executing plans, it was fully recognized

that a high intelligence rating reveals only one of the many factors required in the successful executive—native capacity. Hence it could be relied upon only to measure this one factor. Where large native ability was essential, the intelligence test might become the only sure way to establish it in the case under consideration. In rating the reliability of the results from different tests we have given performance preference over paper testing and both preference over interview and credential.

We shall get ahead in the better adjustment of workers to their employments as snap judgment gives way to more careful selection. We shall make this selection more effective as interview and credential are more widely and intelligently used. These will be more intelligently used in proportion as jobs are analyzed to determine the real demands they make upon the qualifications of workers for success; as interview and credentials are better adapted to uncover and estimate the presence or absence of these essential qualifications; as employment officials gain through training and experience wisdom in studying men; and as these employment officials come to recognize the weakness and limitations of these devices as a method for reliable measuring. When they do, they will strive to make more scientific and therefore more reliable their procedures in the use of interview and credential; they will rely upon it extensively only for judging intrinsic and complex traits not otherwise to be measured; and they will supplement their findings through these devices, which at their best constitute a more or less unreliable rule of thumb method, by approved standard tests.

The next chapter discusses the place and service of the schools in the discovery of the fitness of youth for different occupations, in advising them what callings to select, and in helping them to gain entrance to suitable employment. It must not be forgotten, however, that, just as in the case of vocational education, the mass problem of selecting the right worker for the right job is, and probably always will be, a field or employment problem

rather than a school problem. Effective service in the vocational advisement and placement of youth by the educator and the social worker will become a tangible, feasible enterprise only as industry and commerce improve their present methods of selecting and placing their employees of every kind and grade. They will do this as system succeeds chaos and guess gives way to the scientific testing of the assets of men.

QUESTIONS AND POINTS FOR DISCUSSION

1. Are there not certain advantages in the "knock about" method of finding what one can do best as compared with any more scientific method for securing efficient occupational adjustment? Make a list of the relative advantages and disadvantages of the two social devices.
2. Make analyses of several simple jobs with which you are familiar, such as opening a pocket knife, opening a box of safety matches and lighting a match, tearing a stamp from a sheet of stamps and putting it onto a letter. Make these analyses by operations and by human and mechanical operating points according to the method described in one of the references.
3. What other efficiency factors affect the conserving of human effort in addition to those given in the discussion in this chapter?
4. Make a list of the job requirements of six jobs with which you are familiar, as, for example, a paying teller at the bank, a street car conductor, a school janitor, an office boy.
5. If we take into consideration the generally admitted characteristics of the adolescent, how far would any evidence of special qualifications for a given job as shown at the age of 15 be of value as indicating the sort of work that the person could best pursue when he has reached his maturity?
6. Make a list of the undesirable factors that come into play when the average boy or girl leaves school and gets a job with no knowledge either of the job requirements or his or her own qualifications to meet these requirements.
7. Do you know of any plan in operation at this time that will deal efficiently with this situation? Why will this plan do it?
8. If possible, go through the experience of taking a set of standard intelligence tests of some kind. While doing this, do not concern yourself with time or prospective rating, but consider carefully just what qualities or capacities you bring into play in each case. Make a list of these.

9. What is meant by general intelligence as distinguished from "job intelligence"?
10. What evidence can you secure as to the correlation between the I.Q. and commercial or business success? In your opinion does, or does not, such a correlation exist?
11. What is the value of intelligence tests in selecting occupational workers? A certain individual is found to test up to an I.Q. of 120. How would this fact affect your advice to him as to selecting any of the following occupations: Lawyer, stevedore, printer, retail salesman, school teacher, preacher, brick layer, railroad conductor, ship master, college professor, farmer? Give reasons for your answer in each case.
12. In two parallel columns set up the evidence for and against the use of intelligence tests in selecting workers for given jobs.
13. Select a specialized job with which you are familiar and see if you can devise a test that would indicate probable success or failure to meet occupational demands on that job.
14. Make a study of some of the standard mechanical aptitude tests and determine just what a rating on these tests does really indicate.
15. Under what conditions could a person who had never practiced a trade make a good showing on the tests for this trade—a thing that has really happened.

BIBLIOGRAPHY

Looking Backward. Edward Bellamy. Houghton Mifflin Company, Boston.

As a part of this story, there is described the methods used by society in the year 2000 A.D. for enabling each individual to contribute to the general good in the way for which he is qualified.

The Instructor, the Man and the Job. Charles R. Allen. J. B. Lippincott Company, Philadelphia.

Certain chapters of this book deal with the methods of analysis used in securing functioning occupational content.

The Foreman and His Job. Charles R. Allen. J. B. Lippincott Company, Philadelphia.

Chapters in this book describe methods of analysis for individual jobs and a scheme for analyzing supervisory and managerial jobs.

Analyses as published by the Federal Board for Vocational Education.

- No. 95. An Analysis of the Bricklaying Trade.
No. 52. Theory and Practice for the Machinist's Trade.
No. 36. Foreman Training, Parts I and II.
No. 69. An Analysis of the Railway Boilermaker's Trade.
No. 67. A Survey and Analysis of the Pottery Industry.
No. 75. Analyzing a Poultry Enterprise.

These bulletins all give examples of the results of methods of analysis as applied to different occupations.

Readings in Vocational Guidance. Meyer Bloomfield. Ginn and Company, Boston.

An Analysis of Secretarial Duties and Traits. Charters and Whitley. Williams and Wilkins Company, Baltimore.

Prevocational Education. Leavett and Brown. Houghton Mifflin Company, Boston.

A description of the work in prevocational education regarded as a form of education previous to employment.

Human Efficiency and Levels of Intelligence. Henry H. Goddard. Princeton University Press.

A brief and easily read description of intelligence tests and the conclusions that have been drawn from their use.

Publications of the World Book Company.

This company publishes all sorts of test material.

The Junior High School. L. V. Koos. Harcourt, Brace and Company, New York.

A small book giving the functions, features and programs of the standard type of junior high school. Since this type of school is now generally regarded as the chief agency in the school system for aiding young people to find themselves, this description is of interest in connection with the text.

Personnel Management. Scott and Clothier. A. W. Shaw Company, Chicago.

A very complete treatise on the whole question of employing and dealing with employees. Touches upon many of the points raised in this chapter.

Hiring the Worker. Roy Kelley. The Engineering Magazine Company, New York.

A smaller book dealing with the same points as above.

Psychological Tests in Business. Kornhauser and Kingsbury. University of Chicago Press, Chicago.

Fundamentals of Vocational Psychology. C. H. Griffitts. The Macmillan Company, New York.

Employment Psychology. Henry C. Link. The Macmillan Company, New York.

Judging Human Character. H. L. Hollingsworth. D. Appleton and Company, New York.

The Use of Psychological Tests in the Educational Vocational Guidance of High School Pupils. Procter. Journal of Educational Research Monographs, 1921.

CHAPTER VI

THE DISCOVERY AND PLACING OF ABILITY THROUGH TRAINING

The last chapter showed the social wastefulness of the crude methods used by most employers for selecting workers, and discussed the value of various kinds of tests for discovering the fitness of different persons for different jobs. There is still another way to find the suitability of an individual for an occupation and that is by training or instruction, which in some of its aspects at least, may be regarded as only another method of testing. This instruction may roughly be considered as taking two general forms: vocational training and prevocational training.

Discovery and Placement Through Vocational Training

As has been repeatedly indicated, most workers in almost every line are selected for a job and learn it by the pick up method where neither tests nor training are used to help in the selection. It was also pointed out that, theoretically, a try out on the real job is the best test of fitness for it, and that working at the job is the most effective way to gain proficiency in its performance. This would be true in practice as well, if new workers were selected more carefully for entrance so as to reject the obviously unfit at least, and if they were recruited as learners and instructed as learners in a systematic way.

In the next chapter will be shown how proper training on a job reduces the effort of learning, shortens the period of learning, and reduces effort in the performance of the work, by teaching from the start, the use of correct skills and knowledge. In this way the cost of learning in time, material and effort is greatly reduced.

At the same time this instruction process is sure to reveal at a very early stage whether the worker is capable of meeting the demands of the job even with the aid of training. This early discovery of fitness or the lack of fitness prevents him from continuing for long periods in training for an occupation for which he is not adapted, and thus reduces the social cost of discovering what he should or should not do. Organized training, substituted for the present haphazard method of learning an occupation, would operate not only to reduce cost of learning, but the cost of discovering ability to learn as well. It would not only improve the proficiency of workers in occupations, because of better training, but also because of better adaptation to their employments.

Training as a selective agency—A number of years ago one of the authors was connected with the development of a training course for a large industrial plant, one of whose products was fancy paper boxes. Under the pick up method previously in vogue, a girl employed for this job would in the course of about two years either work up to maximum earning power on piece work, or having shown her inability, would be transferred to some other job. In the effort to improve these conditions, a school giving organized instruction was established in which girls were trained on successively difficult jobs. After this school had been operated for a while, two facts appeared: About one out of every three girls never could make paper boxes successfully. The girl able to make paper boxes could be trained up to her probable maximum earning power on piece work in not more than two months.

It is evident that this change from the pick up method to the organized training method saved money for the plant in two ways. The girl who could not make paper boxes was very quickly "spotted" and shifted to some other job which she could do, while the period required for the capable worker to reach maximum earning capacity and hence maximum production, was very greatly shortened. There was not only a distinct saving of money

to the plant, but also distinct corresponding benefits to the girl. The girl who could not make paper boxes was saved a long period of discouragement, fruitless effort and the breaking down of her working morale. On the other hand, the girl who could make paper boxes quickly, discovered her ability to master the job and rose rapidly to her maximum wage earning power with corresponding results in satisfaction and morale.

Any agency which can aid the individual and his job in getting together, conserves human resources. This is precisely what vocational education has done and is doing no matter whether carried on in the schools or carried on in the shop, the office, the home or on the farm. So true is this that some one has aptly declared the most effective vocational advisement in the world to be advisement to training, because this training, wherever given, not only equips for the job, but reveals whether the youth likes it and is capable of meeting its demands. This is only saying that training, after all, is the surest test to fitness. The best way to find whether you can or cannot make a success of any employment is to take instruction and training in it and see. In proportion as vocational education is organized, an individual may try and see under favorable conditions, and, therefore, more quickly determine his fitness.

Placing trained fitness—In our hit or miss methods of the past, we have quite generally assumed that most persons at least have little or no difficulty in securing the work for which they are naturally best adapted. This is by no means true, for the economic world is full of misfits today. It is becoming very evident that after he has been trained to some degree of proficiency in an occupation, a person fails in many cases to secure employment in it. Every time an individual who is especially adapted to any employment or who has in addition been prepared for it fails to use his training, there has been a distinct loss of human resources.

Any agency or device, which aids the person with special qualifications to get employment where he can best use these

assets, is conserving social resources in a very direct way. It is one thing to find the aptitudes of a youth, but it is quite another thing to put him on the road to using them where they will count most. This is the reason that the testing of applicants by employment managers for large concerns having a wide variety of occupations is so much more definite in purpose, method and result than the vocational advisement service of most public school systems.

Any agency, therefore, which sees to it that the trained individual is placed in the work for which he has been trained is acting in a very direct way to conserve social resources. This responsibility for placement has been recognized in vocational education from its inception. From the beginning, the vocational schools have shouldered this responsibility because they recognized, more clearly than other types of schools, the social necessity for placing the trained product of their work where it can be used to the best advantage. The development of placement systems in the general public schools of this country has unquestionably come about through the demonstration of the values of this service in the vocational training work.

Only real training a test of fitness—From the standpoint of its testing and placing functions, vocational education, wherever and however carried on, will be effective in proportion as it trains through the use of real participation in the occupation rather than through artificial exercises, pseudo jobs, or second hand experiences.¹ Any tryout of fitness of an individual for any employment gains in value as it approaches actual conditions on the job.

One of the authors listened the other night to the proposal that an elaborate national institute for the handicapped be founded in

¹ Since the following nomenclature is somewhat new, it is briefly defined here: Exercise. A piece of instructional or training work where the principal object is to give skill and practice in the application of technical knowledge, but where the value of the product is in no way considered. An example would be where a learner in brick-laying was required re-

which handicapped persons with every conceivable disability from blindness to tuberculosis would be tested to determine the kind of work for which they were best fitted. On the large scale proposed, this plan would involve the expenditure of millions of dollars every year. Most discouraging of all it was urged by an engineer of national prominence who, in his well meant enthusiasm, could not see that, under the artificial conditions for many lines of employment which at its best the institute could provide, no tests of fitness for this or that occupation could be exclusively relied upon even if the subjects of the test were normal and not disabled.

Whatever else may be said about training on the job in shops and offices and on the farm, it always trains and tests the worker in real operations and processes under the real conditions of employment, and therefore uses a real participating experience as the basis of its instruction. This can not always be said of the instruction in related technical knowledge given to workers in special classes operated by large business concerns. This instruction tends to pattern after the traditional school policy of dealing with general and abstract rather than specific and concrete subject matter; of giving cold storage knowledge rather than functioning information; and of supplying general rather than "pusher education" for use as needed to meet actual problems repeatedly to pick up and string mortar on the top surface of a block of wood that represented three bricks in a stretcher course, or where a girl in power machine work ran seam after seam on a fragment of cloth.

Pseudo job. Where the job is carried out under the most essential conditions, but where the finished job is of no value and is later destroyed. An example would be the laying up of a series of brick between two uprights, these representing two window jambs or door frames, the job being carried on in a school room or at some place removed from actual construction work.

Real, or production job. Where the product is secured under all the essential conditions that would surround the worker in the actual practice of the trade. An example would be where the bricks, as laid by the learner, were laid as a part of an actual building job and when laid, remained as a permanent part of the construction.

and difficulties. When an employee of an electrical company has to figure line drop, resistance, strength of current and safeguards for a circuit, he wants direct help for this task, not profound instruction in the general theory of electrical energy!

The greatest weakness of our preparatory vocational schools, frequently called all day vocational schools, is the difficulty of providing participating experiences in the occupation that are real and not pseudo, and of carrying on these experiences under conditions that approximate those of actual employment. Unless schools are keenly alive to this danger, they are likely to find themselves or be found, teaching obsolete processes with discarded tools and machines. The situation becomes even worse when, in their efforts to give what is traditionally called "fundamental training" in mathematics, science and drawing and other technical training, they neglect to train the youth to use this knowledge in the real processes of occupations and trades. When this occurs, not only has the knowledge failed to function as equipment for work, but the training fails to test the youth as to his ability to use such knowledge as a working tool.

Training the best test of fitness—Notwithstanding these weaknesses found in vocational schools and particularly in prevocational schools, their work as a testing device for discovering the interests and aptitudes of the youth before he enters upon wage earning is at its worst, better than all other methods in vogue except systematic training on the real job. At its best this school training provides the best method of discovering and advising interest and fitness because it operates under controlled conditions and can be made to shorten the process of discovery by the rapid shifting of the youth from an unsuitable course to a more suitable one leading to the occupation for which he is better adapted, or for which he may have a greater interest. This procedure is possible in proportion as these schools offer experiences from a wide variety of occupations. A good school offering good training for one line of employment is under present condi-

tions at least a better test of the suitability of this line for a youth than training on the job. It must be remembered, however, that both check him against the one issue—whether he is adapted to the work taught.

Discovery and placement through prevocational training

It is recognized that this term is used in a double sense in this country. Many people still use it to describe the training given for an occupation previous to employment; this training is, therefore, pre-employment or "prevocational." In its more widely accepted and technical use, the expression describes all the experiences in the form of information, instruction, testing, advising and even placement in a job, given to an individual, which aid him in making an intelligent choice of an occupation or which train him for the occupation he selects. While many devices have been developed, they can roughly be classified as vocational guidance through information, vocational guidance through training, and vocational guidance through the real personal advisement of youth by a competent expert. Inasmuch as this last service is, to say the least, still largely a matter of discussion rather than performance it will not be developed here.

Vocational guidance through information—This scheme is based on the theory that an intelligent choice of calling can be secured through the acquisition of facts about the opportunities and demands of various employments. It is carried out through various devices for supplying the youth with information about occupations. A number of excellent books have been produced, many of them highly serviceable which have found a use in this work. These give information with regard to all such matters as conditions of employment, range of wages and salaries, opportunities for advancement, special aptitudes required and other pertinent facts about a large number of occupations. In many cases this information is supplemented by direct talks by those engaged in different callings and not infrequently by visits to occupations themselves.

Provides no test of interest or aptitude—It will be noted that this type of prevocational training employs no means whereby individuals can actually measure their abilities and interests against the working conditions and requirements of an occupation. This has been recognized as a serious weakness, and is, at least theoretically, obviated by the second type.

Vocational guidance through prevocational training—This second scheme is based upon the theory that it is possible to guide an individual by giving him actual participating experience in a number of occupations. Through this participating experience he can measure his interests and aptitudes against the actual requirements and working conditions of such occupations. In this way, he can without doubt get some idea of what is required in industrial employment taken as a whole, or commercial employment taken as a whole, or agricultural employment taken as a whole. What is more important still, he can learn whether his interest and bent are toward this or that field of economic activity including the professions. If the sampling of occupations is real instead of pseudo, he can learn the same things about a few specific occupations in industry, or commerce or agriculture. It is obvious that an ounce of such experience is worth a ton of talk.

This second type of prevocational training is found in the stated aims of many junior high schools and of many so-called prevocational schools. In one well known junior high school, ten shops are conducted. These shops are assumed to be replicas of actual production shops. The instructors are assumed to be competent workers drawn from the industry. The equipment and the jobs are assumed to be similar to those found in the occupations themselves. In this school, students are routed through a series of shops during the junior high school period. Usually, they are given participating experience in at least six of the ten.

It will be noted that both plans reduce the economic loss caused by the entrance of our young people into employment, entirely ignorant of the demands to be met and of their own assets.

While the first method depends primarily upon observation and fact acquisition, the second method depends upon actual participating experience. It is obvious that the two methods can be combined, and this is frequently done as it should be.

Prevocational training needed in vocational education program—The acid test of any method of prevocational training is the degree to which it shortens the period of economic adjustment and thereby promotes the conservation of human resources. As long as any individual works at any job or takes training for any job for which he is not well adapted, he represents a potential human resource misapplied. The problem of effective economic adjustment, and the development of devices whereby that adjustment can be rendered more efficient, is, therefore, one of the most important problems which confront a democracy.

It is somewhat unfortunate that, up to this time, the movement for vocational education has directed itself primarily to the establishment of courses of training for direct entrance into employment, and has given but little attention to any prevocational training by which the youth might be aided in selecting the training course through which he could capitalize his special assets to the best advantage. Preliminary prevocational training of some kind must be a part of the program of vocational training in this democracy if we are to avoid the present sad wastage of human resources not only in the economic field but in vocational training as well.

Multiplicity of occupations as a difficulty—While the value of prevocational training through the sampling of human experiences is unquestioned as a theory, in practice it is one of the most difficult problems with which society has to deal. No scheme developed up to the present time can be honestly said to have had any high degree of success in its results. In the case, for example, of the junior high school just described, an experience in six school shops sampling six employments is assumed to equip an individual for selecting just the one of these six restricted in-

dustrial occupations which he is best fitted to pursue. Nothing is foretold about his fitness to enter other occupational fields, and the Census reports list more than 3,000 recognized occupations in the industrial field alone, representing many hundreds of distinct lines of employment and more than 5,000 gainful occupations in all.

The changing job as a difficulty—Another difficulty which has very seriously hampered the development of prevocational training has been the idea that at all stages of his career, an individual progresses in the same line of work. It has already been pointed out elsewhere that this is not the case. New jobs arise to which the individual must adapt himself. He changes from one line of work to another. Even if he remains permanently in one line of employment or one occupation, the changing demands require the constant adaptation and readaptation of skills and knowledge. Can it be fairly assumed that the reactions of the youth between the ages of 14 and 15 to samples from various occupations, or that his first employment into which he enters at 15 or 16, give any indication as to what sort of work he will be doing at the age of 30? Looking at the situation squarely, the most that can be hoped for is that through prevocational training a youth can be aided in securing his first employment, and thus enter upon a wage-earning career through the door of a job which he is fitted to undertake.

There is danger in some quarters that those engaged in vocational guidance will, in their commendable earnestness, attempt to do a more refined and precise job, in connecting young people with occupations, than is either possible or profitable. Much would be gained just now by centering efforts not upon the all too difficult task of getting the youth into his best job, but upon getting each youth to some job for which he has some fitness.

The changing youth as a difficulty—Another serious question, not yet answered, is the degree to which the reactions or interests of an adolescent in any way indicate or predict what he will be

when he becomes an adult. Assume that a boy in the junior high school, in the process of routing him through the different shops, becomes extremely interested in machine shop work, and makes a good showing in that activity. He therefore decides to be a machinist, and takes further training to fit him for that occupation.

Here apparently is a case where a clear eyed intelligent choice of a career has been made. Yet would any one be able to say with certainty that this boy will always be a machinist or be in the machinist business or even in any of its kindred lines? All our knowledge of the adolescent indicates that his interests and even his aptitudes change and that these things do not usually stabilize until the period of maturity. It therefore remains a very serious question as to how far the prevocational experience and enthusiasm of youth actually functions in the life career of an adult.

It is very important that effective prevocational training should precede vocational training and that vocational training should accompany or precede actual entrance into employment. This means that prevocational training, if it is to be opportune and therefore helpful to the mass of our young people, must be given in the early stages of adolescence. On the other hand, when we study the stages of biological development in childhood and youth, we find that the adolescent is so unstable in his interests and apparent aptitudes and such a chameleon in his reactions to his environment, that the stage in his biological development where apparently prevocational training must come, is at the very time when this training can function to the least advantage as a device for aiding a stable mind to make a reliable choice of a calling.

This might be illustrated by the following diagram in which the first column indicates stages in the biological progression from birth to old age, the second column the main characteristics of each stage in this biological progression, and the third column the appropriate kind of training program for each of these stages.

TABLE No. 4

Relation of Training to Biological Progression

I	II	III
Stages in Biol. Prog.	Character	Training Program Needed
Maturity	Increasing stability	Training for pursuit of an occupation as an efficient economic unit
Adolescence	Instability	Vocational training—General Education Prevocational Training
Childhood	Imitation	Fundamental Social Arts

Biological characteristics vs. social necessity—Apparently, there is no escape from the economic and social necessity of directing the attention of the youth to the choice of a vocation at the time when, in his early adolescence, he is most unstable in his reactions, most notional in his attitudes toward life and work. This apparent impasse probably accounts for the difficulties which have been experienced in developing effective prevocational training for him. It also raises the question as to whether better results, in more stable and continuing interest and choice, might not be secured if more attention were given to helping employed youth, in the upper stages of adolescence and prematurity, to discover and capitalize their economic ability more intelligently.

Difficulties permanent, not temporary—We must accept these difficulties as a permanent, not a temporary situation since we cannot do away with the multiplicity of occupations, nor change the biological characteristics of adolescents, nor avoid the necessity for directing their attention toward the choice of a vocation. In meeting this very real situation, any scheme of prevocational training can adopt for purposes of vocational advisement only one of three possible aims or policies:

1. *It can help the youth to choose between a limited number of specific occupations.* This a school might do by giving

him a chance to sample experiences in, let us say, type setting, cabinet making, plumbing, house-wiring, sheet metal, forging, drawing, bricklaying, concrete work, typewriting, and gardening.

2. *It can help him to choose between a limited number of lines of employments or groups of occupations* as distinguished from specific occupations. Courses might be provided, for example, in printing, wood working, metal working, elementary electricity, elementary drafting, gas engine work, and possibly in clerical work and soil work.
3. *It can help him to choose between broad fields of employment or groups of lines of employment* as distinguished from either lines of employment or specific occupations. This attempt is broadly described as giving the youth experiences in the mechanical arts, the commercial arts, the agricultural arts, and in the case of girls, in the household arts also.

First plan inadequate and futile—Measured by its real policy, the first plan can be and frequently is a very decided success. Measured as a device in vocational guidance for meeting the real conditions and needs of employments, it is so narrow as to be utterly inadequate and futile. In the richest curriculum in the country, a total of not more than 20 specific occupations are represented by experiences, yet these constitute less than 1% of the total number of such occupations in the production or industrial field alone, while typewriting and stenography taken together are practiced in much less than 5% of the occupations in the commercial or distributive field, a close analysis of which would reveal almost as many specific occupations in all its branches as are found in industry. The same thing could be said with equal force as to gardening as a specific occupation in the field of agriculture.

Those who propose this plan for discovering the interests and

aptitudes of boys or girls have to make one or more of a number of assumptions:

1. That all or most of these boys or girls intended to go or would have gone into one or the other of the occupations sampled, anyhow. Therefore they must be equipped to choose between them. In reality only a very small percentage of them would do so without the sampling experience and most of them do not after sampling.
2. That all of them have interests and aptitudes specially adapted to these occupations and therefore every one of them should choose and will choose only between those offered. This is so obviously contrary to the facts that it needs no discussion.
3. That the occupations selected for sampling are most socially desirable because they offer the best opportunities for wage earning and are therefore the best ones. There are many hundreds of industrial, commercial, and agricultural occupations paying as much, and many of them, better wages and salaries. Certainly a locomotive engineer earns more than a plumber, a successful farmer more than a cabinet-maker, and a salesman more than a stenographer.
4. That the occupations selected are most socially desirable because they are most needed as services, and therefore most valuable, but who shall say that the work of insurance salesmen is not more valuable to society than that of a typist or that a boiler maker is less important than a blacksmith?
5. That there is special need for more and better workers in these preferred occupations which makes it necessary to establish special facilities for selecting and recruiting for them—a thing patently untrue.
6. That for some reason these occupations are entitled to special consideration and assistance in selecting more com-

petent workers, which of course no one contends for a minute.

7. That experiences from these occupations, as contrasted with those not selected, can be taught under a school roof. Since they lend themselves to school conditions they are the most feasible to use.

This is the real explanation for the selection of specific occupations for practical work for prevocational classes and must always continue to be. It should be clearly recognized as a further fact that the selection of these occupations as a matter of convenience does not constitute any soundly democratic or adequate plan for the selection of specific employments. Furthermore, the biological characteristics of the adolescent point to the unreliability of his temporary interests in specific jobs and the probable futility of fixing his choice, definitely and permanently, on any one of them; while the flux and shift in these jobs themselves make the task of preadjustment to their conditions and demands both uncertain and difficult.

It is tragic to read in the school reports of small school systems the proud statement that "a course in cabinet-making has been established to help our boys find out what occupation they should follow," but it is no more so than the declaration of a large school system that "shops have been established in ten different trades and our youth will now have a chance to choose one of them as a life calling."

Second plan not adequate—In the effort to meet the dilemma of the first plan just described, the second plan seeks to help the youth select from a limited number of lines of employment. He is given, for example, some experiences in wood to see if he would like to work in wood. There is no attempt, however, to discover interest or aptitude for carpentry or mill work, or cabinet-making or pattern-making, or carriage building or car building or bridge building or any of the other numerous employments in

which workers in wood are engaged. This plan obviously widens in a way the range of jobs to which the training may lead, but the experience is less specific in its significance for most of them at least. Here again, however, the limited number of lines of employment for which the school provides or can provide any sampling experience is so small as compared with the total number of lines of employment followed by the American youth that all the criticisms, if such they may be called, of the first plan apply with almost equal force.

Although the United Census Reports recognize hundreds of distinct lines of employment among the more than 3,000 industrial and manufacturing occupations of the country, no school has offered experiences in more than 10 of these lines. Commercial teachers have apparently not been interested in the matter. As a result little attempt has been made to provide any sampling experiences for this work beyond a little typewriting, yet the Census reports many distinct lines of employment in commerce. In the cities agriculture is represented, if at all, by gardening, although the Census recognizes hundreds of lines of agricultural employment, of which gardening is one of the least important. Apparently the assumption is that no city youth wants to go or should go to the country. Prevocational training in a few fields of employment for selecting one from all of them is also inadequate, undemocratic and unsocial.

Only the third plan is feasible—Since it is not possible to provide any adequate scheme of prevocational training which will help the youth to choose between many occupations or between many lines of employment, any reliance upon such training for either of these purposes should be abandoned. It would help very much if current discussion would recognize the real situation and avoid false claims for the practical arts as devices for vocational guidance.

As proposed by the third plan they can be used in the discovery of interests and aptitudes, industrial, commercial or agri-

cultural, which are much more likely to continue with the individual than enthusiasm for some particular occupation in one of these fields. To be adequate, however, this type of prevocational work should not only provide experiences in mechanical activities, but in commercial activities, in agricultural activities, and, in the case of girls, household activities as well. The stress laid upon mechanical arts courses in city schools to the neglect of these other fields has taken from the work about all its value as a vocational guidance device.

Summary—Prevocational training, to the extent to which it can be efficiently developed, is an agency for the conservation of human resources. It functions in all fields. It is as important in the professions, in agriculture or in commerce, as in the mechanic arts. It is somewhat unfortunate that for historical reasons the problem has, in the minds of many, been tied up with the idea of service for the children of the poor alone. Because the masses of our people in the cities work with their hands, prevocational training has been largely focused upon the activities of industry to the neglect of commerce and agriculture. The assumption that only the children of the poorer homes need prevocational training; or that only poor children enter industrial pursuits; or that poor children enter only mechanical employments are not in line with the theory or the facts of social progress in a democracy.

Whatever form prevocational training may finally take, when it is fully developed on an efficient basis, it will aid all youth to find the place where each can best serve in the economic field, whether in the professions, on the farm, in the office, or in the industrial plant; and it will render that service regardless of the economic condition of the home, or the occupation of the parent.

Once this third plan is accepted, the question of which of the mechanical arts or trades shall be taught becomes of little importance since the aim is not to teach a trade or even about a trade, but about industry. It still remains true, however, that

whatever trades are sampled, the training should be in real, not artificial experiences, otherwise these lack significance as a test of interest and aptitude. Consequently it would be better for the school to select only those arts or trades which it can teach well. This is also true of commerce and agriculture.

This has led most prevocational schools to use what they call training in the fundamental industrial arts of metal working, wood working, and power which usually takes the form of work on the gas engine. To these, as a fourth line, printing is added because of its supposed educative value in the teaching of English. Through these arts they seek to gain the double end of sampling experiences as vocational guidance and familiarity with tools, materials and processes believed to be of some value in all industrial employments.

Unsatisfactory as much of this work still is because of its artificiality, due largely to the employment of teachers without real commercial experience in the work they teach, it provides the only logical scheme of the three for vocational guidance. It is logical only because it can do what it claims to do—furnish experiences from broad fields of employment as an aid in choosing between these fields. At the same time, it must be admitted that it throws little or no light on the question of which occupation a youth shall choose on entering employment, even after he has chosen one of the three broad fields. For this reason the use of prevocational training for vocational advisement is necessarily very general, and its value as a job finding device is and doubtless always will be very limited. The vocational advisor must depend on other devices for this task.

The preceding statements are made in no critical spirit. Probably no problem in vocational education is more vital to a democracy than that of securing the more efficient adjustment of workers to demands in the economic field. The efforts of those who have recognized the importance of this problem and who have striven to solve it are worthy of all commendation. In numerous

places, however, communities are being urged to expend and are expending large sums of money for experiments in prevocational training, the soundness of which in aim and procedure is doubtful. The writers of this book would not be true to themselves if they did not draw attention to the difficulties inherent in the problem and to the inadequacy of some of the typical schemes now in operation.

Entirely independent of any attempt to use them for purposes of vocational guidance, the practical arts have come and come to stay in the curriculum of the regular elementary and secondary schools. In spite of occasional drives by the reactionaries for a return to the so-called fundamentals and the elimination of "fads" these arts have, even in their present state, won for themselves a permanent place as sound pedagogical devices: because they provide the best opportunity of the schools to use organized participating experiences for instruction; because they furnish first hand instead of second hand knowledge as teaching stuff; because they appeal to natural interests; because they afford new avenues of expression; because they minister to the creative spirit; because they give understanding and appreciation of work, workmanship and workmen; and because they can be used, better than any other school subjects, for training youth in the habit of resourceful thinking to meet the demands of real situations and real problems. All these things are not always accomplished with the practical arts, but they have been, and are being done, and can be done anywhere under competent leadership.

QUESTIONS AND POINTS FOR DISCUSSION

1. Make a list of the points that must be covered in a really efficient plan for prevocational training.
2. To what extent will information as to the requirements, the opportunities and the financial returns to be expected from the pursuit of any given occupation aid an individual in determining his qualifications for that occupation?

3. Is it, or is it not, socially desirable to assume that young people, coming from a given economic or social class, are going to follow occupations in any given occupational group?
4. Many graduates of institutions training for specific occupations such as agricultural colleges, technical schools and professional schools do not follow the occupations for which their training was intended to fit them. Is this situation desirable or undesirable in a democracy? Why?
5. If ability is a fixed quantity, how do you account for the fact that many people, when confronted with a new job, seem to develop new abilities to meet its requirements and so make a success of the work? In such cases, are new abilities actually developed or do unsuspected abilities merely come to the surface?
6. Is it any part of the job of society to undertake to select occupations for its citizens? If not, why not? If so, on what grounds could such a procedure be justified?
7. Was it justified in the army? If justified under those conditions, why not under peace conditions? Give reasons pro and con.
8. Which has the greater social value to a democracy, a general placement service for all citizens or a placement service only for the youth on his first job? Why?
9. From the standpoint of its value compare, as "participating experiences," (a) exercise experiences; (b) pseudo jobs; (c) real, or "production" jobs.
10. What do you understand is meant by "training in fundamentals"? Is there any such thing? If so, give examples.
11. In such a plan for prevocational training in connection with Junior High Schools, as is described in the text, what are the limiting conditions as to its effectiveness, in terms of the stated objective of the plan? Under what conditions might such a scheme be of considerable social value?
12. Set up for discussion a scheme for giving a satisfactory training which would enable a youth to choose between the five great occupational groups: agriculture, commerce, industry, the professions and nautical pursuits.
13. Compare the advantages and disadvantages of any organized scheme for prevocational training with the "knock about" method now commonly in vogue.
14. Is the fact that the average boy in Northern cities gets six different jobs between the ages of 14 and 16 socially undesirable? Give reasons.

15. What educative experiences do boys or girls get in the "knock about period" that they can not get through any form of organized prevocational training? What undesirable educative experiences do they get during this same period?
16. In the absence of any effective plan for prevocational training, can any scheme for vocational education function efficiently from the social standpoint? Give reasons.
17. Compare the relative advantages and disadvantages of the exercise, the pseudo job and the production job, from the standpoint of their prevocational training value. From that of their vocational training value.

BIBLIOGRAPHY

Adolescence. G. Stanley Hall. D. Appleton and Company, New York.

Deals with adolescence from the standpoint of its psychology and its relation to physiology, anthropology and sociology. One of several books by Dr. Hall in which he describes the result of his studies of the adolescent. Of interest in connection with this chapter on account of the reference it makes to the characteristics of the adolescent as he develops through the biologic progression.

Prevocational Education in the Public Schools. Leavett and Brown. Houghton Mifflin Company, Boston.

A general discussion of that form of prevocational education which is intended to precede employment. This book gives the theory and much information as to how the work was being carried on up to the date of publication.

Readings in Vocational Guidance. Meyer Bloomfield. Ginn and Company, Boston.

In this book, Mr. Bloomfield has brought together a mass of material dealing with the objectives, procedures, theories and discussions as to prevocational education.

The Worker and the State. Arthur Dean. The Century Co., New York.

A general discussion of the function and problems of vocational education. Presents an extension of certain of the discussions in this chapter and a considerable amount of discussion and information as to the relation of vocational education to social progress.

Employee Training. John Van Liew Morris. McGraw-Hill Book Company, New York.

A description of the plans for organized training which have been worked out by a considerable number of corporations.

Industrial Education, Its Problems, Methods and Dangers. Albert H. Leake. Houghton Mifflin Company, Boston.

A general description of types of schools, special problems, apprenticeship and vocational guidance. Valuable in connection with this chapter on account of its general descriptive character for those readers who desire to go into the matter in greater detail than is furnished in the text.

American Apprenticeship and Industrial Education. Paul H. Douglass. Columbia University and Longmans, Green & Co., New York.

A very complete treatise on vocational education with special regard to apprenticeship training. Includes some discussion as to prevocational training.

CHAPTER VII

THE TRAINING AND DIRECTION OF ABILITY

Conserving human resources—Whenever the right man is employed on the right job, human resources are utilized to better advantage. When natural fitness for any occupation is trained in the skills, the technical knowledge and the job intelligence necessary to the best performance of the work, human resources are equipped for more intelligent service. Society gains still again when wise management gives this selected trained ability the opportunity to function in employment so as to secure the highest results with the least cost in time, material and energy. This is utilizing human resources to still better advantage.

Vocational education and the social conservation program—All these things constitute what might be called the social program for conserving human effort. In general, it may be said that vocational education aids this program in these ways and does so in proportion as it is organized and therefore effective:

1. It reduces the effort of learning.
2. It shortens the period of learning.
3. It reduces human effort in the performance of the job.
4. It supplements the man with the machine.
5. It releases labor and intelligence to be employed elsewhere as needed.
6. It extends man's command over nature by the discovery of new principles and inventions; by the development of new labor saving devices; and by the more efficient unit performance of tasks.

Reducing the Effort of Learning

In any haphazard or pick up scheme by which a man learns to perform a task, human effort is wasted in a number of ways. Wherever a learner does not receive the benefit of instruction, time and therefore effort are wasted in abortive attempts to learn how to do the work. It is safe to say that the overwhelming proportion of workers in this or any other country go through this experience and suffer this loss.

Learning by guess and try—Left entirely to his own devices in attempting to meet the demands of a new occupation or a new demand in an old occupation, the worker must rely upon the imitation of others; he must learn in a blundering way by what might be called the method of trial and error; or he must make use of both of these devices. Where he is not surrounded by other workmen performing the same task, imitation is impossible and he must depend entirely on what might be called his own experimentation.

Usually he is required to turn out a product and all too often is paid on the basis of what he produces. Consequently this observation and imitation of others, even when possible, must be accomplished in the midst of his own set task. The chance view that he gets at irregular intervals of the work done by others is at best fleeting, spasmodic and superficial. It must be remembered also that this learning from the work of others under such adverse conditions is attempted by a workman new at his task, serving without direction, worried about the immediate demands upon him and having no previous skill or training on which to build. In short he is a self teacher without skill in self teaching, attempting to profit by the work of others through chance observation and uncertain imitation.

Even if this observation and imitation, as happens very infrequently, is open to the learner under favorable conditions, the chances are small that he is observing the work of a master per-

former. If he relies upon this method, he must assume that the one whom he imitates is not only doing the work right, but is using correct form, avoiding unnecessary motions, and discharging all the details of the task in the best way. Wherever these assumptions are true and wherever the conditions of observation and imitation are favorable, the worker makes progress in manipulative skill on the job in proportion as he is earnest, observant, imitative and capable.

The inefficiency of the pick up method—Unpromising as are the results to be expected from this system of observation and imitation under the given conditions of production, the situation is much worse when the worker is left to his own devices. He has no recourse but his own trials, the checking of his own errors and the improvement of his work on the basis of his own experience.

The social cost of the pick up method—In either case, this pick up method or unorganized vocational training is sure to result in an unnecessarily prolonged learning period; in much poor or damaged product, especially during the learning period; in wrong ways of doing the work; in unnecessary time consuming and fatigue producing motions; and in incorrect notions about the task in all its details which may have to be corrected completely and which can only be corrected at great loss. Worst of all, the worker who survives carries all these deficiencies into his after career, with resulting damage to product, lowered production, reduced income, lessened morale and an inevitable increase in the labor turnover.

To a greater or less extent, according to the special conditions, the work of a worker so prepared for his job has to be redone or scrapped, causing a wastage of natural material and overhead cost, as well as a sad expenditure of misdirected effort and energy, all of which is socially wasteful and unnecessary.

Whether learning by chance observation or by the method of trial and error, the workman trained by the pick up plan has

only an accidental connection with the details of his job. As an imitator he gains from time to time, fleeting glimpses of the performance of others, which, as has already been pointed out, are more or less superficial. Close observation of the details of the job and the way in which these are handled he seldom gets. No one has ever told him what the details of his job are; nor shown him how they are to be performed; nor why they are to be performed in this way; nor the order in which they are to be performed; nor their relationship to each other. This is more true when deprived of observation and imitation of others he is thrown back on his own devices.

In either event, there is a sad loss of effort due to disregard of learning difficulties. He does not know what the points of operation are on the job, nor the important things that need to be safeguarded or looked after at each of these operating points. Nor does he know why these places are "danger places" and therefore important places. Nor does he know what are the difficulties which he has to face and plan to overcome at each of them. Nor does he learn in any systematic or what could be called coherent or pedagogical way.

As a result of all this, there is a loss of time spent in reaching maximum skill and productivity. All this is beside the further fact that the learner is deprived of the right which a democracy should give him, of learning the right way to do the work in which he is engaged so that he may make the most of his assets.

Right and wrong ways to learn golf—The difference between the worker who learns by his own unaided devices, the worker who learns by chance observation and imitation, and the worker who learns under instruction is very much like the difference between the man who learns to play golf by playing alone, the man who learns by watching other people, and the man who is taught the game by someone having a fair degree of proficiency as a player.

The novice who goes out to practice by himself when the

greens are vacant does not understand what he is doing. He simply bangs away in a desperate effort to reduce his score from day to day. He does not know what is good form in executing a shot because he has never seen it. He has no standards of performance. He does not comprehend what are the learning difficulties and therefore can not address himself in any effective fashion to overcoming them. Once in a while he makes a good stroke by accident but does not know why. Consequently he is unable to repeat it. When he makes a bad stroke, he does not know why. Consequently he is in no position to correct his mistake. When he encounters a difficulty he does not recognize it until the incident is closed and he is facing the result. Even if he did recognize this difficulty, he would not know what to do about it. Most unfortunate of all he develops bad habits (form) in his playing which it will always be difficult or impossible for him to unlearn. Everybody who plays golf knows that the above statements are true, but they are no more true of a golfer than they are of a workman learning a new job in a shop where there is neither a model worker to observe and imitate or an instructor to follow.

Another learner at golf may begin by "tagging along" after a golf foursome. Each player in turn is watched as he addresses himself to the ball on tee, fairway and green. Later this novice undertakes to imitate what he saw. He does not know why the motions he imitates were made. He does not even know whether these motions are correct. He may be imitating a poor player or a good player with bad form succeeding because of natural ability in spite of bad form. His model being wrong in either event, he acquires from the start of his own play, bad form and habits, which interfere with results and which can be unlearned only with great difficulty if at all.

He may associate himself with a friend in a twosome or help to make a foursome in which he is the novice. Unless the friendship be strong it is altogether likely that his companions are

poor players, as good players do not care to play with a beginner. As a participant in the game our novice now has a chance, of course, to watch more closely the strokes of others. His imitation of them is therefore under more advantageous circumstances than when he watched from afar. Nevertheless it is still imitation upon which he relies. It is still a poor way to learn unless those with whom he is playing have correct form and undertake in the progress of the game to give him some instruction. More progress is always made in the game by those who have the benefit of such favorable circumstances.

It still remains true, however, that the great majority of golf players learn what they know about the game by playing with others and endeavoring to pick up from time to time by observation and experience the increased knowledge and skill which will enable them to better their score. This is no different from the way in which most of the tasks of the world are learned by those fortunate enough to have the chance to watch and to that extent profit by the work of others knowing more about a tool, a machine or a process.

Most men who learn to play golf, however, learn under the tutelage of a friend who has had some experience at the game. They may play in a twosome or a foursome. In either event the friend takes a personal interest in the novice. He attempts to do the same thing as the golf instructor. He does it less effectively, however, not because he is not as much interested, but because he has had less experience in the game, is less successful in his own play and has not addressed himself to the teaching task. It goes almost without saying that to the extent to which such a friend has skill that should be imitated, form that needs to be copied, talk that inspires interest and encouragement, knowledge of the points of difficulty to be met, and the natural ability of an instructor, will the novice learn the game quickly and as it should be learned.

The ideal way—Of course the ideal way to learn the game of

golf would be to take golf lessons under a trained instructor. For a consideration, this demonstrator and teacher undertakes to shorten the learning period and improve the game of the novice. To do this he sets up standards in stance and stroke; encourages effort; corrects mistakes; and establishes good form through repetitive practice. Since he knows the points of difficulty and the causes therefor which arise with a novice, he can arrange his instruction in a progressive teaching order. He demonstrates as well as talks, encourages at the same time he corrects; and lifts the learner from one level of performance to another.

The learner measures his progress by the reduction in the number of strokes it takes him to complete the course. The instructor measures his success by the progress which the learner makes in the correct execution of different plays since this forms the basis of more rapid progress in the days to come. This is true instruction whether on the golf field or in the shop. Fortunate indeed is the worker who has a chance before going to work, or after going to work to have the benefit of such training. Invaluable, indeed, to a firm is any foreman able to conserve a new worker in this way!

Right and wrong ways to train workers—In the production world all of these methods are found in practice. Two of them have been previously described: the novice who learns the best he can by himself and the novice who learns by the chance observation and imitation of the work of others. When he learns under the voluntary instruction of a friendly fellow workman or foreman a beginner undoubtedly progresses more quickly and realizes his possibilities better than by the other two methods just described. The best results, however, are obtained under the guidance of a regular instructor, trained in the methods of teaching, who may be a foreman especially qualified for the task, a foreman instructor especially detailed for this service, or an expert workman qualified to give instruction with whom the novice is put to learn.

Making a capable person responsible for training new workers and workers at new jobs is the plan which more progressive employers are beginning to use in the conservation of new recruits, and of workers transferred or promoted from one occupation to another. Those who have installed such a plan find in practice that it prevents the wastage of material, the wear and tear on machines, injury to equipment, reduced output, excessive cost of production, idle machines, reduced wages, abortive effort, loss of time to the worker, lowered morale and labor turnover.

The concealed overhead—All these evil results of the haphazard or pick up methods of learning an occupation go into what has already been described as the hidden or concealed overhead of costs known to be present in a business but difficult sometimes to realize and detect and still more difficult to calculate. Undoubtedly the greatest of these costs are those due to the poor workmanship and poor management found in every division of the economic field. Both these weaknesses are in turn due to the lack of effective training of workers and of leaders for their work. It is a curious fact that, although the emergency war training demonstrated the value of vocational education when efficiently organized, the American business man, with all his reputed keenness to save a dollar and all his reputed resourcefulness in finding ways by which to save it, has very generally failed to grasp the sinister importance of poor training in his production costs.

From the standpoint of the production of community wealth through the utilization of resources, the loss in this country from the concealed overhead must be something enormous. If the sad wastage of human effort and natural resources or the unnecessary cost of commodities which is inflicted upon the consumer was realized, the American people would have long ago demanded that more efficient methods of vocational training be employed. When these things are fully recognized, this demand will unquestionably be made and enforced.

Shortening the Period of Learning

It is of course evident that any agency which reduces the concealed overhead in any enterprise makes for the conservation and maximum utilization of both human and material resources. This is true from the standpoint of the workman as well as of the employer. One of the factors which seriously affect this problem of costs is the time consumed in getting a job done. This fact is universally recognized in industrial production. Indeed it might be almost said that it has become a fetish in that field. It is just as true, however, in the case of any social or civic enterprise. Consequently, anything that will shorten the period for learning any human task, whether it be that of a school boy or that of a productive worker, contributes to the conservation of human and natural resources.

If we assume that an individual having no knowledge whatever of some task sets out to learn it, a certain amount of time will be required to bring him up to the predetermined degree of mastery of that activity. In proportion as this time is reduced to the lowest possible minimum, conservation has been promoted for the following reasons:

Training as a time saver—The quicker a worker is brought up to required skill, the quicker the loss from unsatisfactory service is removed. The quicker he arrives at productive capacity, the quicker does he become an asset instead of a liability and the quicker do his deficiencies disappear from the overhead cost of the business. The quicker he arrives at full earning ability, the quicker is he able to market his own assets in the most effective way. It is equally true that he is of more value to the industry or the occupation as a competent worker than as a learner. Consequently, the sooner he learns the sooner he becomes a desirable asset to the industry and the sooner that industry becomes able to pay him a desirable wage.

Let us assume a situation where a helper in some line of production must serve seven years to qualify for a licensed exami-

nation. All experience shows, however, that an ordinary workman can secure that capacity in three years. Here we have a serious loss not only to the workman himself but to the industry as well. In making this statement, the writers are aware that it is contrary to the theory of long-term apprenticeship held by many employers and representatives of organized labor. We have no quarrel with the institution of apprenticeship. It is a thing in which the authors firmly believe. We do not believe, however, that it is to the advantage of either the employer, the apprentice, or the union to prolong this period of learning beyond that required to train the apprentice thoroughly in the practice of the craft under modern conditions. The truth as to what length of apprenticeship should be required for many so-called skilled trades today lies somewhere between the traditional idea of a long term of more or less uneducative experience and the current idea that the so-called apprentice should be made a rapid productive worker at once by confining him to one simple task or operation. It is probably safe to say that both of these views are equally destructive and unsound and equally vicious in their results upon natural and human conservation.

The abuse of apprenticeship—As a matter of fact (in this question of apprenticeship) very little attention has been paid to the actual time required to train effectively. On the one hand the unions have constantly stood for the idea that no one should be admitted to full participation in a craft until maturity; hence their interest in seeing that the apprentice does not become a journeyman too young. On the other hand, the employer has seen in the prolonged apprenticeship period an opportunity to secure from the apprentice considerable work which he would otherwise have to give to a journeyman or to a fully competent worker and which he can secure from an apprentice at less than the going rate.

Apparently the lack of real educative experience for most apprentices during this long period of time serving has bothered neither union nor employer. The whole institution has

become in too many quarters a device for marking time and for exploitation. In many cases where union and employer have agreed upon an apprenticeship arrangement, the length of the period of so-called instruction has not been determined by any factors making for efficient training. Nor has the length of the period of apprenticeship had anything to do with the real demands upon the apprentice or the time required to enable him to meet those demands effectively. This will become all too apparent whenever the apprentice is restored to his ancient place and the instruction is standardized and given to him in an organized way.

We venture to predict that the time will come when both employers and unions will have to face the question of apprenticeship as a device for conserving youth and human resources rather than as a device either for exploitation or for the avoidance of trade difficulties.

“Easing” the beginner into his job—It is a matter of common knowledge that in learning any task, the speed with which a learner secures a grasp of it is largely affected by what psychologists call inhibitive factors. If he is scared or confused, for example, to that extent his thinking machine stops working. In other words, anything which distracts his attention and prevents his concentration upon the task to be learned or the experience to be acquired, slows down the learning process. Within recent years it has been found possible by analysis to determine what are commonly called the learning difficulties which accompany various kinds of learning jobs. Suppose a boy is starting to learn the carpenter trade. Because they happen to be putting the sheathing on a roof, he is sent up there to drive nails. The experienced worker or the foreman thinks nothing of going up on the roof because he is used to it. The boy, however, has not been in the habit of working on a sloping roof where he must hold on with one hand and drive nails with the other. Under these circumstances he will invariably devote most of his think-

ing to the problem of holding on and not to the proper fastening of sheathing.

Evidently any learner who must devote 75% of his mind to the problem of self-preservation and only 25% of it to his job will not progress very rapidly. If as his first experience in driving nails that boy had been given work on the ground floor, he would have been relieved of his fear, which in this case was the inhibitive factor, and could have given all his attention to learning his job.

One of the authors has seen a strong, able-bodied man required for the first time to handle an "air gun" so frightened that he shook all over. The experienced worker derides this thing because he has forgotten his early experiences. Such things as fear, new and strange surroundings, the demand for prolonged attention to a task, resulting in mental fatigue, the necessity of mastering involved processes all play their part in retarding the progress of a learner unless his training experiences are so presented to him that he does not get all these things at one time. He needs to be gradually "eased" into them and eased into them so that each experience paves the way for the next in the most effective teaching order.

It is probably safe to say that in any plant or enterprise where no systematic instruction is given, this inhibition of the worker is present as a hidden cause of poor workmanship not understood and not regarded as of any importance even if recognized. It often results in a tremendous overhead which is entirely concealed.

In proportion as there can be set up what can be called an effective progressive order of instruction through which these learning difficulties are minimized, and through which the individual uses to the maximum what he has already learned in mastering the new job, the training period will be correspondingly reduced and the training given correspondingly improved.

Reducing Human Effort

Imagine a situation where there was no transmission of knowledge from one generation to another. As each generation died, it took with it everything that it had acquired in the way of knowledge and skill. It is easy to see that there would have been no progress and each generation would remain at a very low level of savagery, since it would acquire only what it could learn during its own life span. This situation does not exist to the extreme just described. Each generation does transmit, in some way, not only its own acquirements but that of all preceding generations. If this were not done, the human race would not progress. The most precious asset of any people is this heritage of social knowledge and skill. While this is true, few people realize what a tremendous amount of lost motion and wasted effort is expended in passing on this priceless heritage from one age to another. Our ordinary processes of transmission are crude, expensive and inefficient because the machinery for this service is unorganized.

Any agency, therefore, which promotes the rapid and complete transmission of racial experience to individuals at any time during their lifetime, promotes the conservation of resources. The extent to which organized vocational education can and does do this is but little recognized at present. Most people are just beginning to realize how crude is our process of training workers and how wasteful is our failure to give them the instruction by which they may profit from the experience of others in the most effective way.

If it be assumed that economic efficiency is a social demand so insistent as to create a corresponding social duty of helping every worker meet this demand, then he has a right to the heritage of knowledge and skill pertaining to his work, yet the modern world is denying this right to him. This is said with full recognition of the degree to which the diffusion of informa-

tion has been facilitated in our day by such agencies as the telegraph, the telephone and the printing press.

Pathetic lack of training facilities—In the field of vocational education the lack of effective means and methods for transmitting skills and functioning knowledge is pathetic. With the exception of the professions, which are favored vocations of college grade and well provided for, there is not in the United States one single calling, pursuit, trade or occupation for which a complete and efficient training process has been established that reaches and meets all the needs of all its workers. Not 5% of our productive workers have any opportunity to secure organized training in skills through shops, farms or schools.

All the schools thus far established, including correspondence schools, have diffused technical knowledge to less than 10% of the farmers and mechanics of this nation. It is doubtful whether there are at the present time as many as 100,000 nominal apprentices among the more than 13,000,000 wage earners employed in American industries and, if by apprentice we mean one who is receiving systematic instruction as a learner in shop or school, there are less than 25,000 real apprentices (or less than one to every 440 persons) employed in industrial pursuits. Outside of a few trades less affected by specialization, the old apprenticeship has ceased to exist and even in these it is rarely found outside of the larger cities and manufacturing centers. Only in spots here and there do we find the beginnings of a new apprenticeship in the efforts of corporation schools and part time extension classes to help new recruits in a small number of employments. All the day industrial trade courses thus far established are enrolling annually about 60,000 adolescents in preparatory courses, leading to a total of less than 20 out of approximately 3,000 industrial occupations recognized by the U. S. Census Reports. If we direct our attention to the ten dominant manufacturing lines having the largest number of employees, we find that nine have no recognized national plan for training;

three are not credited in the Government reports with even one local school; while at least four are not represented by a single recognized text book furnishing information in practical form concerning the machines, operations and processes used in the business.

Sad lack of teaching material—Not only is training conspicuous by its absence, but when attempted it is too often poorly done. The efforts of shops to confer skills on beginners are greatly handicapped by the poor instruction given by foremen or expert workmen entirely untrained for their task and by the emphasis laid upon production at the expense of education. In some lines there are no text books for use in conferring technical knowledge. Where text books are used, few meet the real needs of either learner or adult. Usually they are written by technicians who know the theory of the operations and processes used, but do not know from experience the practice. As a result they fail to understand the real problems and needs of the worker. Consequently, the text book is too general, too abstract, too technical—in short, “over the head” of those who need it most. On the other hand, those who do possess the real skill and knowledge needed do not know how to put it down on paper or lack the time and opportunity to do so with any degree of effectiveness.

“Rediscovering America” unnecessarily—There are only two ways by which a man can secure skill and knowledge in any occupation. He may get it, as has just been described, with the help of others who give him the benefit of what they themselves know, as where one farmer teaches another how to plant potatoes. The only other method, as has been pointed out, is by his own experimentation, where by repeated trials he learns how to do his work or why he should do it that way.

Whenever, as the result of the experiences of others, the correct procedure has been worked out for performing any task the use of the time and the energy of the new learner to rediscover it does not pay, and should be as unnecessary as the redis-

covery of America. For a long time men have known how to perform all the standard operations on a metal lathe, yet every day novices, for lack of training when needed, are muddling their way through to a rediscovery of the same operations. Farmers have long known how best to rejuvenate soils, but every day new farmers are learning the same lesson by sad experience.

When new procedures have to be worked out, however, or new facts have to be discovered, experiment is the only device that can be used. Hence laboratories and research departments. On the other hand, all knowledge and all skills once established can and should be transmitted wherever needed to prevent the social waste of ill directed, blundering experimentation. Since the great bulk of what may be called job training is drill in standardized practice, experimentation is wasteful and inefficient. It might also be said in passing that even where experimentation must be used to discover new facts or new procedures, it must start with a knowledge of known facts and use known procedures. Every step in the development of the aëroplane and the radio mechanism has been taken in this way, but so have all forward steps in every discovery and invention.

All research work is most successful when it uses such procedures or methods as have already been found efficient. Both in the training of research men and in the training of workers for all occupations, the degree to which they are saved experimentation in order to discover correct ways for doing their work makes for the conservation of time, energy and money.

One of the authors entered upon the career of teaching with no professional preparation. During some ten or fifteen years of service he gradually learned by experiment something of the technique of teaching. He learned that if he taught things in certain ways his students seemed to grasp them. On the other hand, if he presented things in other ways, they failed to understand. About fifteen years of this sort of experience, he was fortunate enough to secure some training for teaching. He

found very much to his surprise that all the successful devices and methods which he had acquired by painful experiment, painful not only to him, but to his students as well, were well known practices in the profession.

Had he known them at the beginning of his teaching career, he probably would not have "muddled" for so long and taught so little. Nor would it have been necessary for him to improve his technique by so long a period of experimentation at the expense of his students. This is just as true of any other pursuit, agricultural, industrial, or commercial, as it is of teaching.

Shortening the period of learning—We will shorten the period of learning for people in any line of work in proportion as we develop two things: first, the standardized procedures in the performance or teaching of processes; and second, standardized procedures in the teaching or transmitting of processes to learners. The first step is to determine the most efficient way of doing a job and the second is to transmit that most efficient way to the learner as quickly and as thoroughly as possible. Only as we determine and use both can we reduce the period of learning to the minimum; conserve the workers' time; promote the conservation of resources; and increase social wealth for use in realizing desirable social ends.

There are doubtless many different ways to perform any operation or task, but there is only one best way to secure desirable results at least cost. Every golfer knows from his own experience and that of others that different players use every conceivable variety of stance and stroke and fare accordingly. Every successful golfer knows that there is one best way or at the most only a few best ways to perform any detail of the game and those who master it rise to proficiency according to their natural aptitude or ability. Consequently, the first step in training a good golfer is to give him from the start this approved practice. Hence the high desirability of learning from a good player who has mastered it.

It is equally true that there are many different ways or methods of teaching others this standardized procedure, but there is only one best way to secure desirable results in the learner at least cost. There are many excellent golfers who are poor instructors of beginners because, while they have mastered the correct playing of the game, they have not mastered the best method of conferring this upon others.

Knowing and teaching—It is one thing for a foreman to know the most effective methods of performing a given operation, but it is an entirely different thing for him to know how to transmit this effectively to the novice. He is much more likely to be master of the process than master of the art of “putting over” to others what he knows or can do. It is probably safe to say that occupations are nearer to a meeting of minds on standardized procedure in the performance of different tasks than instructors from either shops or schools are on standardized procedure for teaching approved practices.

Giving instruction as needed—A most casual observation will show that it is impossible to give people a complete equipment for life at any one time or period. They are continually in need of adaptation and readaptation to changing demands and therefore continually in need of additional assistance. This has already been discussed in previous chapters. It is just as true for training in the economic field as in any other field.

The recognized principle in vocational education is that such training is effective in proportion as it is given to an individual at the time that he needs it for immediate use. The cold storage plan of giving the adolescent or youth large quantities of information with the hope that he may be able to use it in after years as demands require has never been found effective. The fundamental principle of effective vocational education is that every man should be given what he wants at the time that he wants it. When this principle is carried out in practice his period of learning is obviously greatly shortened. He is relieved of the neces-

sity for experimentation and of the necessity for relying upon cold storage information and training which was not only poorly comprehended when received but having laid dormant and unused has become obsolete or passed beyond the power of effective recall and application. On the other hand, instruction as needed helps him over his difficulties one by one as they arise.

It is just as foolish to talk about complete preparation for a life occupation as it is to talk about complete preparation for citizenship. The idea that somehow we can give a youth all the knowledge or skill he needs upon which he may draw as a never failing and sufficient help in meeting social or economic duties is absurd, but held by so many people that it interferes with every attempt to make the schools an adjusting rather than a cold storage agency. They should be touchstones giving help as needed. They certainly cannot function as they should in a democracy as long as they continue to be regarded as universal panaceas conferring upon immature and inexperienced youth a complete equipment for every rapidly changing social and economic duty and responsibility. When this is fully realized among other sweeping changes in our educational policies and practices will be the establishment at public expense of adult education of every conceivable kind, social as well as economic.

It has already been shown that the main aim of education should be training in the habit of resourceful thinking to meet situations. This training is best done when any individual dealing with a problem is assisted just enough to help him over a difficulty he cannot solve alone, and thus give him a fresh start for his own independent thinking. As missing facts are supplied he is started on the road toward using them to meet the situation which confronts him. The ideal teacher really performs the same service as a pusher does on a transcontinental train. When this train comes to a grade so steep that it cannot mount on its own power, a pusher engine behind pushes it over the grade and then leaves it to proceed again on its own power, this process

being repeated wherever necessary. This sort of "pusher work" is the highest type of efficient instruction.

Vocational education as a "Pusher Device"—In its very nature vocational education for most productive occupations serves most successfully as a "pusher" rather than a "cold storage" device. Its declared aim is to fit persons to meet the demands of employments. In industry and agriculture at least and more than we usually recognize in commerce, these demands are constantly changing, as has already been described.

This constant need for adaptation and readaptation of workers to changing devices and methods can be met only as training is given when needed to help them over immediate difficulties with new problems. Not long ago, for example, a new method of treating dough reduced the time required for fermentation from about six hours to about thirty minutes. The diffusion of information concerning this new process is not only vital to many bakers, but a pusher service in vocational education.

It has also been pointed out that men rise through any line of industry from one specialized employment to another, step by step, largely in the same way that a child learns to climb from one step or tread to another. Each job in the line that he holds gives him some experience as an aid to promotion, but the next job makes some additional or special demands requiring skill or knowledge which he must get.

Again, vocational education should serve as the emergency device by furnishing him quickly and directly with what he wants as an aid in his next advance. As the movement for efficiency in the use of human effort has progressed, it has brought in its wake the subdivision of tasks, the specialization of employments, and large scale production of which we will doubtless have still more rather than less. As occupations have tended to become less general and more and more differentiated and specific, the demands for skill and knowledge have become immediate, direct, and very specific. Only as vocational education

adapts itself to these conditions will it be able to function as a real service to productive workers, and it may be truthfully said will workers avail themselves of this service. Their test is the very practical one: "Will what you offer to give me really help me in my present job or the one I want to get?"

All these considerations explain why the traditional four-year apprenticeship course for prospective journeymen so earnestly offered by trade schools a few years ago have virtually become obsolete, why the general evening class giving full or complete courses in mathematics and drawing to tradesmen have been supplanted almost everywhere by short direct unit courses, each dealing with some unit phase of the subject; and why these unit courses are offered tandem style one after the other so that the worker student may take only one or more of such courses as he needs or may take them all. When, for example, a two-year evening course for garage men was established ten years ago, it advertised instruction in one long course as automobile repair work. Now it advertises unit courses in frames and axles, gears and transmissions, carburetors, gasoline engines, ignition and magnetos, starting and lighting.

Knowledge for use—Organized knowledge taught for immediate use also has obvious pedagogical advantages over organized knowledge with deferred value for future use. When the farmer who is about to be ruined by the insects that have taken possession of his crop is taught how to destroy them, he has a vital need and therefore a vital interest in the information that causes him to give intense attention to instructions. His training has a very concrete motive—the saving of his crop, and, to use the language of the schools, may be said to be motivated. To realize the difference in the attitude of the learner and the results gained from such motivated education and the teaching of facts as unmotivated information for possible future use, one need only compare this farmer with a high school boy in a rural community dawdling over a page in his zoölogy describing the insect pests that infest different plants.

Whether it be a shop, office, farm or home operated by the school or whether it be an employment for wage from which the learner comes to a class for help, he not only knows what he needs in his work and for his promotion but he also possesses a real participating experience with tools, operations and processes that is immediate and vivid. He comes knowing what he needs to help him and returns to apply what he has learned. This apperceptive basis or background of experience is very concrete. With it the learner thinks in a very concrete way. He expects and is interested in instruction that applies to his problems in concrete terms and solves his difficulties in a concrete way. Entirely aside from its value in helping a worker to meet the demands of his occupation, such instruction is more likely to develop in him the reflective habit than almost any other experience in life—the tendency to think things out for himself rather than rely upon memory and upon a conclusion of undigested facts having no application, so far as he can see, to his need.

Thinking for a purpose—Power to do results from resourceful thinking which is not a general faculty but a special mental habit and therefore developed by repetitive practice in the intelligent use of facts to meet concrete situations. This requires an understanding of this concrete situation: a selection of the facts bearing on it and the use of correct thinking procedures in applying these concrete facts to the concrete problem to be solved.

There are three ways, for example, to give a machinist power in using mathematics for cutting gears of different sizes to gain specified results in power and speed. One would require him to study, years before he ever sees a lathe or a gear cut, all the general mathematics from arithmetic to calculus that are involved in the derivation of the formulas used in gear cutting. A second would be to teach him all these formulas about gear cutting at a later date but operate no lathe. A third would be to teach him formulas and their use to get answers for real purposes at the time he must have them to cut gears. Only the last plan

gives either the ability to use mathematics in the operation or the training in resourceful thinking that constitutes real power to do.

Perhaps most of this chapter can be summarized in the statement that in proportion as training is given at the time when it is really needed does the mind of the learner go along in its thinking processes with that of the teacher. Assuming a capable teacher, this is true economy of time, money and effort in training.

Setting up instruction in progressive order—It is clear that every man suffers loss in effort who learns any task through his own unaided attempts or who, aided only by chance observation and imitation, learns it in a casual or accidental way. He might be said to be continually stepping on his own feet. In this way his period of learning is unnecessarily prolonged, a thing which can only be avoided by some plan of organized instruction which will set up a progressive order of learning and put him through it. Only by this sort of orderly, cumulative training is it possible to prevent one learning experience from interfering with another, and to make each experience serve in turn as a preparation for the next.

In many day vocational schools, for illustration, we find provision for a series of job experiences which each pupil must get in the shop of the school. We also find provision for distinct courses of related shop or technical knowledge such as drawing and mathematics, and industrial sciences. These are taught in class rooms to groups of students, sometimes by separate trades, sometimes from mixed trades. Under these conditions, an individual faced with the task of performing a certain job in the shop usually finds that certain parts of the technical knowledge necessary for this job have been given him from one to three months previously, while other parts of this necessary information he has not been taught at all because as the course was laid out they are scheduled to be taught at a later date. This, of course, seriously interferes with his ability to do the shop work

intelligently, and, correspondingly, with his training in the intelligent use of facts to guide skill.

The vocational training for any occupation given by a school will be effective in proportion as it is able to tie up shop experiences with functioning knowledge so that the pupil gets help from the class at the time that he needs it for use in the shop, and gets experiences in the shop which will help him to understand what is taught in the class. This is a goal attained by virtually no institution today. We believe that it will never be attained until the individual instruction of pupil in both shop work and shop knowledge takes the place of group instruction.

This can only be done by substituting the project method of training for the present method of separate courses for shop work, for mathematics, for drawing, for science, for shop English, and other subjects. This is simply proposing that a pupil serve full time under a capable instructor, as the industrial apprentice did under a competent journeyman, on the shop floor and its adjacent room facilities. Such an instructor would give help when needed by the pupil on his project, putting him on his own effort in his work and assisting him as a "pusher device" over difficulties only when necessary. Such a plan would give, as no other can, interest, self-reliance, initiative, resourceful use of facts to meet situations, and power of intelligent thinking in the vocation. All this amounts to saying that vocational education will succeed in reducing the learning period in proportion as we are able to cut out "cold storage" knowledge on the one hand, and to train in the use of "functioning knowledge" on the other.

From the standpoint of whether or not they set up the most effective progressive order of learning the manipulative processes, the shop experiences given by most vocational schools are very much open to question. Perhaps most distressing of all is the fact that virtually all the apprenticeship training in this country does not recognize either the value of progressive steps in learn-

ing shop projects, or of giving the why of things at the time the how is being taught.

This applies equally to apprenticeship schemes which are without supplementary class instruction, and to those where the class is added to the training scheme. To advocate a progressive order of learning for the worker in any task in order to shorten the period of learning is to do exactly what is done when a standardized procedure is set up in any shop process itself.

No learning vs. a learning period—It has been unquestionably demonstrated that the man of superior intelligence and strong ambition will succeed somehow in getting his training. Many other men, however, who would prove to be excellent on the job if properly trained, fail in securing the necessary ability and skill when left entirely to unorganized training. They lack the persistence necessary to overcome the handicaps of the pick up methods of learning. This means that many men who would prove a highly desirable asset to an occupation are never able to master it for lack of systematic assistance. They are potential assets to the business which are not realized upon and their number is far greater than is commonly realized.

Reducing the turnover—Under the pressure of war conditions and with organized and effective training provided, competent workers were made out of thousands of men and women who never in the world could have learned their work if obliged to do so in the usual way. If it be accepted as a principle that the social order prospers in proportion as every individual realizes his highest potential capacities, then this great body of people capable of better things, who under present conditions are left to work at inferior jobs, represent a sad failure to realize on potential human assets—a failure that is a grave hindrance to social progress.

The surest way to reduce the labor turnover in any plant is to train its workers properly. The experience of firms that have seen this to be true substantiate this statement. In the case of

many individuals, organized and efficient instruction means the difference between no learning at all and the shortest learning period which will bring them up to capacity. The whole preceding discussion can be summed up in the statement that vocational education, in proportion as it is efficient and organized, increases the wealth which can be produced from natural resources by reducing the period of learning so as to bring an individual up to satisfactory standards of achievement in the minimum time.

Reducing effort in performing a job—The ideal conditions in any place where work is to be done would be gained if every employee was doing his task in the best possible way. This would mean that every worker practiced correct form in the performance of his task; that he possessed all the necessary information helpful in his employment; that he had developed job intelligence in the use of this knowledge adequate to the best performance of his task; that he reached high standards of workmanship approved by the business; and that he was able to perform his task with the required speed and without unnecessary fatigue to himself.

Under such conditions the maximum product will be secured at the minimum cost. In proportion as these conditions do not exist, we have increased production costs due to ignorance resulting in misapplied effort and the wastage of time and material; we have fatigue with all its attendant evils; and we have trouble, not only between the employee and the management, but also between the employees themselves, with all its attendant train of cost-producing factors.

An analysis of many cases of friction in a wide range of industrial plants has shown that the fundamental cause is almost always the absence of one or more of the fundamental requirements listed above. Evidently, vocational education becomes a great cost-reducing agency in proportion as it succeeds in equipping the individual quickly and easily with correct form, func-

tioning knowledge, job intelligence, standards of workmanship, and the ability to meet requirements without undue fatigue.

Looking facts in the face—It might be said in passing that the success of any vocational training scheme depends in the last analysis on the degree to which it attains the objectives just described. Any vocational training school or any other scheme of training men for occupations must face a very real and practical test instead of a theoretical and philosophical one. It must face facts as they are and not as it thinks they are or ought to be. It must give knowledge which does function and not knowledge which people think ought to function. It must set up standards and these standards must be those of the occupation, and not what the school dreams they ought to be or will be some time in the future. It must give training in processes as they are actually performed, not in processes as they are adapted and changed to meet the conveniences of the school. It must train under actual working conditions, not under pseudo conditions. If it does these things, it performs the service for which it is established. If it fails to do them, it has proved false to its purpose, its trust and its opportunity.

Supplementing Man by the Machine

The whole development of the last 200 years has been possible because we have learned to supplement the man by the machine. Man unaided can do but little; coupled with a machine he does much. The digging of the Panama Canal shows this. If the primitive method of scooping up dirt with the hands, loading it into baskets and transporting it by man power had been used, the canal would never have been dug. The work of the modern world is carried on not by men, nor by machines, but by teams of men and machines. We talk about automatic machines or specialized machines as if those machines were capable of doing tasks by themselves. They cannot and they do not. Somewhere

behind the machines is the man who contributes his share to the work of the partnership. This contribution may be large or it may be small. In skilled wood carving where only a few simple tools are used, the man contributes most, while the tender of the open hearth furnace contributes but a small part to the work of the team in producing steel.

Team play between man and machine—Regardless of the relative amounts contributed by the man and by the machine, the effort fails unless both contributions are thoroughly and effectively made. Unless every operating point on the job, whether human or mechanical, is thoroughly and effectively covered, the job is a failure. This means that for every job a man must be trained to do his part, large or small. Unless he is effectively trained to do his part, the job fails. As the value of the machine rises, and the value of the quantity of goods produced increases, a higher degree of proficiency on the part of the worker becomes more and more necessary.

When the open hearth process was comparatively primitive, the heater and his gang did all the work at the furnace, by hand. The furnace itself was a very crude structure, and the amount of metal cast in a day was very small as contrasted with the huge output at the present time. The inventor now surrounds the open hearth furnace with a multitude of labor-saving devices which performs all the laborious work, formerly performed by hand, of charging the furnace, drawing the heat and casting the billet. The heater in charge of the furnace and his assistants, however, are now charged with the responsibility for many tons of molten steel having a high value. A mistake at any operating point would ruin the product and bring great loss. Consequently, there is more need that the few workmen still left at the furnace to handle the whole process, including the machines utilized, should be proficient in the part they have to play. Obvious as this is, many steel companies fail to recognize it and still suffer large losses annually because of the lack of proficiency on the

part of the operating crew such as effective training would guarantee.

Change and shift accentuate need for training—While many deplore the onward march of the machine and the specialization of tasks following in its wake, nothing is more certain than that we are to have more inventions and more improved machines for doing the work of the world. Indeed, the invention of new machines will always keep step with the discovery of new processes, new operations, new synthetic materials, and new demands for reducing costs in all processes.

Let it be granted that the part of the worker, whether large or small, in the operation of the machine, requires that he be trained properly to discharge his task. With the change and shift in the progress of machines, their increase in number and their applications to new processes and new fields only accentuate the need for the training of all those teamed with these machines in the performance of any task. The very rapidity with which the changes in what might be called the world of the machine takes place makes constantly more acute the need that the workman become adjusted to meet new demands. The machine makes new requirements upon him which he cannot meet by his own efforts. He needs the help of systematic instruction. In proportion as such instruction is given, will the work of the world be carried on more efficiently and natural resources be conserved.

Machines and quantity production require more and better training—The quantity production methods of our day are constantly substituting for old machines, new and intricate devices representing an investment of considerable sums of money, and are using these machines to mill or handle enormous quantities of material. Any mistake on the part of a worker in the performance of his task may result in damage to either machine or material in the course of an hour, whose total is far beyond the loss that would be caused by any damage to the product of an

ancient hand worker upon which he had spent a year of labor. Under these circumstances whatever the amount of the contribution of the man to the process, what he does must be done right. Consequently, instead of the introduction of machines making the training of workers unnecessary or unimportant, exactly the opposite is true.

The printer of the sixteenth century who set wooden type by hand and with a Gutenberg press made with great labor a few impressions on a small sheet was the wonder of his day. Any mistake he made caused but little damage to his machine or material. Today, copy is set on the linotype at the rate of 4,000 ems an hour. It is then plated and brought on a speed press where 10,000 impressions are made in an hour. Any mistake made by any worker anywhere along the line means great destruction of material and possibly very serious damage to the machines. Consequently, there never was a time in the history of the world when training in the printing industry was so needed as today, a thing which the National Typothetæ of America recognizes probably more than any other national organization of employers and the International Typographical Union more than any other national organization of employees.

Largely owing to tradition, many leaders in vocational education have failed to realize these facts. There is still a strong feeling in many quarters that vocational education is only worth while when given to those individuals whose contributions to the team job of man and machine is large. As a result they think of vocational training only for what they call "the skilled crafts." This mistake is based partly on the feeling that specialized tasks are not economically respectable, partly on the belief that the specialized worker is only the slave of the machine and not its coworker, and partly on the assumption not justified by the facts, that no training is needed for the specialized worker.

So much emphasis is being laid in vocational schools on the idea of training only for the skilled trades to the neglect of the

workers in all other occupations, that there is considerable danger of creating, through this discrimination, a new aristocracy in education, the very thing which we decry in the modern high school when it fits for the professions only.

Releasing Labor

It has already been shown how science and invention result from organized vocational training. The effect of this science and invention appears in the development of new processes, in the modification of old processes, and in the creation of labor saving devices and machines. The whole trend of science and invention has been to substitute the machine for the man, thus releasing human labor which becomes available in other lines, if properly conserved.

Readapting men—The labor so released becomes a potential asset to the state because it increases available human resources. The extent to which this released labor becomes an asset depends upon the degree to which it is utilized in other occupations or jobs in which it is needed and which are socially desirable.

One striking illustration of this occurred in the period between 1850 and 1870, when our Eastern seaboard witnessed the breaking down of the old American Merchant Marine through the substitution of steam for sails. As a result men of all degrees of capacity, from the Master Mariner down, found themselves unable or unwilling to continue seafaring activities in steam driven vessels. During this period the Eastern coast was dotted with places where exceedingly capable and experienced mariners, many of them still in the prime of life, eked out an existence by keeping small grocery stores, or cultivating small plots of land or living as well as they could on their small savings. This was a failure to utilize, by the readaptation of these men to new occupations, their undoubted abilities in other ways.

Perhaps a still more striking illustration has been the effect of

the Volstead Act in wiping out the saloon. This threw out of employment a very large group of men who had been successfully employed in bar keeping and kindred pursuits. Their training and experience suddenly became valueless to them as a means of support, except in so far as a few of them have been able to use it in such occupations as short order restaurants and soft drink parlors. The recognition of this situation brought a serious proposal that the government should undertake training courses preparing these men for successful entrance into other occupations.

Undoubtedly both the introduction of steam and the passing of the Volstead Act created a tremendous disturbance in the economic life of a great many people. It must be remembered that not only were many workers affected by the changing conditions but their families and dependents as well. Some day a far-seeing democracy will see to it, when sweeping changes occur, releasing large quantities of valuable labor assets, that this labor is properly conserved by being helped through training to contribute more effectively in other employments for which it is fitted.

The individual and the total social job—Like everyone else, the authors must accept as sound the proposition that, wherever possible, any machine which can do a piece of work or any part of a piece of work formerly performed entirely by a human being should be substituted for that human being. In other words, we should never ask a man to do what a machine can do. Whether we accept this principle or not as a policy, it is inevitable. It is just exactly what is occurring all around us all the time and is only man's effort to get greater results, in his battle with nature, at less cost.

Those who do not accept this policy as desirable and unavoidable fail to realize that the job of society is infinite in scope, and therefore not limited as to kinds of occupations, numbers of occupations, changes in occupations or the effect of these changes

on individuals, regrettable in some instances as these may be. The social job is a total job and not a series of specialized jobs or employments in water-tight compartments. Society's problem is to get the whole job done; individuals are only the means to an end far more important. They are of value to society in proportion as they contribute to the performance of the social job. Therefore, they must be shifted from one employment to another in the interest of social economy and efficiency. It seems hard to say, but nevertheless it is true, that this process must go on, even where hardship to the individual results. Whenever society makes the demand upon the individual that he shall adapt himself or readapt himself in an efficient way to a new or a changed employment, it is a public duty to help him meet the new requirements. He must be given in some effective way the necessary training in skills and technical knowledge and job intelligence, whatever these may be.

The social job being infinite, there is always opportunity for efficient human employment and effort no matter how much that labor and effort in any field may be relieved by mechanical appliances. The development of labor-saving devices invariably promotes social ends through the release of human labor either for other lines of work on the same level, or for work on a higher level within the same line or another line. In this way the development of science and invention causes both a horizontal and a vertical extension in the utilization of human resources, and therefore in the effective utilization of natural resources.

Vertical and horizontal releases of labor—If we accept the theory of fixed levels of intrinsic intelligence, we realize at once that in any group of human beings there are many different degrees or grades of native capacity or ability. In any thousand printers employed as hand compositors are many men whose level of intelligence is such that they probably would be worth more to the state in jobs of a higher grade. Their work as hand compositors does not require the full utilization of their intrinsic

capacity. To that extent, society suffers as long as they remain hand compositors.

Unquestionably, in the group there will be other men already working up to the maximum of their ability. They are not capable of holding down jobs requiring a higher intelligence level, but they can work upon other jobs requiring the same levels of intelligence. Under these conditions, along comes the linotype, which, we will assume at least, requires a higher grade of intelligence than hand composition. The group of compositors possessing excess intelligence are able to become, with training, efficient linotype operators.

A second group who are proficient compositors remain at this employment and are able to meet the changing demands upon the compositor brought about by the introduction of the linotype machine. Undoubtedly, with the introduction of the linotype on a large scale, there was a third group whose members were thrown out of employment in the printing industry. These were required to adapt themselves in some way to some other employment which they could perform with their level of intelligence.

It must be remembered in this connection that the introduction of the linotype machine has increased the productivity of the print shop; reduced the cost of printing; greatly extended the business; and given opportunities for employment on a large scale never dreamed of by old-time printers. In this expansion many new jobs have arisen within the business to which many compositors have adapted themselves. As a result of an enormous growth in the business itself the total number of hand compositors has also greatly increased, but not in proportion to the growth of the business.

The result of all this has been what has taken place in so many other lines as the result of invention and discovery. First, there has been created a large number of new jobs which are to the economic advantage of society and of the individuals pursuing them. Second, there was a temporary period of hardship

and difficulty produced by a necessary readjustment of the business to meet the new conditions. Third, there has been a great expansion of the business with a corresponding absorbing or employing power so that the business today presents far greater opportunities for employment even in hand composition than it ever did before. Fourth, there has unquestionably been a sifting out of a certain group of individuals who were unwilling or unable to adapt themselves to the new conditions of the business who were forced to learn other jobs and who, if they learned these well, were also of ultimate advantage to society in their new employments.

Democracy wastes its assets—The advance of the hand compositor to the linotype machine was a *vertical release*. The readjustment of the hand compositor to the new job in composition or his shifting to a job in some other line was a *horizontal release* of labor. To the extent to which this vertical or horizontal release employed human aptitudes effectively it was to the advantage of social progress.

One might as well talk about stemming Niagara as to talk about stopping the onward march of science and invention and the resulting labor saving processes and machines. Undoubtedly this inevitable evolution creates a state of flux in which men are required every day to readjust themselves to changing conditions of employment or to adjust themselves to new employments. That this works a hardship on individuals cannot be denied. More tragic still is the fact that human assets thus wasted would, if properly utilized through training, increase social wealth and promote social progress. Yet in the face of this situation this democracy, willing to spend untold millions for the development of higher education, leaves this problem practically untouched, and suffers correspondingly.

Bellamy and the democratic state—Under the ideal social organization of Bellamy's "Looking Backward" no individual mentally and physically capable was allowed to become econom-

ically inefficient. He was regarded as an asset to the state and the state saw to it that, no matter what changes and readjustments developed, the individual was duly and effectively trained so that he could continue to deliver his maximum economical value. Is it too radical to say that a democratic state, based upon the institution of private property, needs, just as much as a socialistic state, to do what Bellamy has pictured; and that the time may come and should come when not only the state itself but employers and employees of all kinds will be required to play their part, if necessary by compulsion, in training every man, every time the need may arise for the proper performance of the socially desirable task for which he is best fitted?

Extending Command Over Nature

Finally, as has been repeatedly pointed out, at least in an indirect way, vocational education conserves human time and effort by extending man's command over nature. This it does by training individuals so that they are better equipped with technical knowledge to discover new principles and to invent and develop new labor-saving devices. It also accomplishes this end by the training of the worker for the better performance of his task, a policy which results in an increased output at a lower cost. It further contributes to this end by giving to the worker the training which enables him to enter into the ranks of the inventor and the discoverer. Fundamentally, however, vocational education renders its best and most direct social service by passing from one person to another and one generation to another the most efficient way of doing things.

It has already been pointed out how research and invention continually modify job demands and job procedures, and why it is continually necessary that these modified procedures and operations be rapidly diffused and imparted. Only as vocational education is effectively organized, is this spread of knowledge

and skill rapidly and effectively secured. Vocational training does not invent or discover, although it affects both invention and discovery and is affected by both. It is as a systematic, transmitting agency of human experiences about occupations—the work of the world—that this form of education serves its largest social purpose.

Management vital to the use of ability—This discussion would not be complete if it failed to point out that after any society has set up a system by which the right man properly trained is fitted into the right job, and after discovery and invention have also made their contributions, one more vital thing is required. There must be such an organization of all the factors that enter into successful management as will secure from human resources properly placed and equipped the highest possible economic results that can be obtained under the conditions. This is equally true for agricultural and commercial enterprises.

Industry gets its results with machines and labor properly utilized. If this utilization of labor and of machines is efficient, corresponding economic results follow. If it is not, the reverse is true. Consequently, society is as much concerned with the way in which employers in every line of business deal with human beings as it is with the way in which they handle natural resources entrusted to their care. For this reason, the question of efficient management in every line of employment is of vital concern to this democracy.

Up to the present time we have been greatly interested in the training of the professional man and the technician. We have also, to a certain degree, made beginnings in the training of workers in many fields of production. We have, however, practically neglected the supervisor and manager. As long as this situation is not remedied, modern democracy cannot hope to secure maximum utilization of its resources, because after all no chain is stronger than its weakest link. Hence, at least in the belief of the writers, one of the most important and practically unex-

plored fields of vocational education is training for that management which, coupled with human labor, science and invention, will give us the maximum wealth with which to carry out our ends.

QUESTIONS AND POINTS FOR DISCUSSION

1. A common method of securing weavers in textile mills is as follows:
 A weaver already employed takes on a helper and so is able to tend a few more looms. As a rule he pays this helper nothing. In fact, the helper sometimes pays for the privilege. The result, of course, in either case, is that the weaver, working a piece basis, earns more money.
 After a greater or less lapse of time, under this arrangement, the helper will persuade the foreman that he can run looms alone and get a job as a weaver.
 Make a list of all the factors that you can think of which make this device for producing weavers efficient because it saves the mill some money.
 Make a corresponding list of factors that make this procedure inefficient because it costs the mill money.
 On the whole, is this device for securing competent weavers as efficient as a definite training program? Give reasons for your answer.
2. How can any plan for assigning workers to the jobs for which they are considered best fitted, deal with the question of the interests and wishes of such individuals? People are often desirous of taking up an occupation for which they are not fitted. Would not the forcing of people into occupations for which they were best fitted regardless of their interests and desires break down morale and so do more harm than good?
3. If a person thoroughly knows an occupation or a job does he need any further equipment to teach it? Give reasons for your answer.
4. Should any training program undertake, in the interests of social efficiency, to go beyond offering training to those who desire it? That is, should the basis of admission to any training program be interest and desire to follow that occupation, or demonstrated special ability to meet the demands of that occupation? Which is the more socially efficient? Why?
5. Considered from the standpoint of social efficiency, which agency is best fitted to conduct and control any organized training program: organized groups of workers, organized groups of employers, or the public? Why?

6. Under the present social order, what would seem to be the chief difficulties in replacing the pick up method of training by organized training?
7. Up to the present time, large corporations have shown more interest in developing organized programs for training than have smaller concerns. Can you suggest reasons for this? Does it mean that the management of the larger corporations have more intelligence? Is their greater interest probably due to any other reasons? If so, what are they?
8. Under modern conditions and in an ideally efficient social state, such as Plato imagined in the Republic, what would be the chief characteristics of the provisions for securing competent workers in all fields of human endeavor? Would the plan work? Why?
9. In your opinion, do all socially desirable occupations require organized vocational education and training to secure the most efficient social results as to wealth production, or is this only necessary for certain occupations? Give reasons for your position as to this question.
10. In what ways does shortening the period of learning benefit the individual, assuming that the training is adequate? Does it benefit society at large? If so, how?
11. Should or should not the four year period of apprenticeship be retained for all skilled trades, regardless of the time that is actually necessary to give adequate training for each trade? Give reasons for your answer.
12. Select some job with which you are familiar. Try to think back to the time when you learned it and recall your state of mind during that learning period. Can you make a list of the learning difficulties that you experienced? If so, do it.
13. Why do we fail to think straight when we are scared?
14. Could this country have attained its present productive capacity if modern methods of communication had not been developed? Why?
15. Develop further the statements made in the text as to the failure of most texts to give what the worker on the job really needs to know. Conversely, give reasons why the average competent worker finds it very difficult to set down what he does know. What are we to do about this situation?
16. List out the advantages and disadvantages of "cold storage" versus "immediate" vocational education and training. Why do we not find more of the latter in our programs for vocational education?

17. Select some mathematical principle: for example, the fact that for two similar right triangles the corresponding angles are equal and the corresponding sides proportional. State exactly how this principle applies in one or more occupations; that is, give the special form in which it appears as special occupational content in that occupation. For example: it is used by astronomers in determining the distances of the heavenly bodies.
18. Discuss reasons why efficient organized training might be expected to reduce turnover.
19. Take some labor job with which you are familiar, such as cutting the lawn with a lawn mower. List out what you do and what the machine does. Do the same for several other jobs. Arrange these as human operating points and mechanical operating points. Compare the relative demands on the man and the machine in cutting off a piece of stock with a hand saw and with a buzz saw or use some other corresponding pair of jobs.
20. A certain manufacturer of labor saving machines uses the slogan, "Never ask a man to do what a machine can do just as well." Is this principle socially sound? Discuss pro and con.

BIBLIOGRAPHY

The Republic of Plato. Translated by Alexander Kerr. Published by Charles H. Kerr, Chicago.

Included in the discussion of the "happy state" are various considerations as to the best utilization of human resources according to Plato's philosophy. Chiefly interesting as showing that a number of what are now regarded as radical ideas are in fact of great antiquity. Methods of training are also described, as well as discussed.

Looking Backward. Edward Bellamy. Houghton Mifflin Company, Boston.

As the usual device in such "futurity tales," the individual is transported into a form of society at a future historical period, in this case to 2000 A.D. The book created much interest when published in 1898 because of the social organization. It is of interest here on account of the somewhat detailed descriptions of the means employed to utilize human resources for the welfare of the State. Methods of selection and training workers are also treated.

When the Sleeper Wakes. H. G. Wells. Harper and Bros., New York.

One of Wells's earlier fanciful "futurity" stories. Interesting in connection with this chapter on account of the description of the organization of society for what was assumed to be the best utilization of human resources for the welfare of the State.

The Instructor, the Man and the Job. Charles R. Allen. J. B. Lippincott Company, Philadelphia.

This book contains discussions as to the social efficiency of organized training and the effect on overhead costs. It also deals in the main with methods of training under commercial production conditions.

Employee Training. John Van Liew Morris. McGraw-Hill Book Company, New York.

This book is of interest in connection with this chapter because it consists of a study of the training schemes of a large number of corporations in a wide diversity of lines. These show how the principles briefly discussed in this chapter have been worked out under practical working conditions. It will be noted that all such training work is an attempt to reduce the concealed overhead resulting from the use of the pick up method. An excellent bibliography is attached.

The Training of Shipyard Workers. U. S. Shipping Board, Philadelphia, 1919.

A brief description of the training work of the training department of the Emergency Fleet Corporation in preparing shipyard workers under war emergency conditions. This publication also includes some studies as to the cost reduction resulting from such training.

Foreman Training. Federal Board for Vocational Education. Bulletin 36, Parts I and II, 1919.

This bulletin contains the report of the work done by a committee of foremen, other representatives of industry and agents of the Federal Board in studying the needs in foremanship for employed foremen. It also suggests methods of procedure. Out of this work came the now widely used "conference method" for the improving of foremanship. This publication is interesting in connection with this chapter because it shows the recognition of the excess cost of the pick up method training in the field of supervision and management rather than in the field of direct production. From the Board or from the Superintendent of Documents, Washington.

The Foreman and His Job. Charles R. Allen. J. B. Lippincott Company, Philadelphia.

A compilation of points considered, of conclusions reached and of typical discussions in foreman's conferences. Prepared as a hand book for the use of those conducting such conferences. Of interest in connection with this chapter because it shows the large number of points on which foreman, trained by the use of pick up method, found it desirable to consider and discuss improved methods of procedure, especially in the field of personal relations and responsibilities.

U. S. Training Service. Washington, 1919.

A series of bulletins on training in industry. Of interest here because they discuss various problems in organized training.

Back to Methuselah. Bernard Shaw. Brentano's, New York.

In this book, Mr. Shaw advances this idea, touched upon in the text: The social problems confronting humanity are becoming so complex that sufficient wisdom cannot be secured in the present span of life to deal with them efficiently. Hence, the only ultimate hope for the preservation of any social order is an increase in the length of human life sufficient to enable these problems to be dealt with effectively through the accumulation of sufficient experiences.

Statistical Abstract of the United States, 1921. Government Printing Office, 1922.

Shows the numbers employed in occupations, and the extent of what might be called nominal or alleged apprentices, as discussed in this chapter. Shows also the vast extent of employments for most of which no systematic instruction is now being given.

CHAPTER VIII

PRESENT THEORIES IN VOCATIONAL EDUCATION

The work of the regular schools is still largely based upon the old faculty psychology and the doctrine of formal discipline. The following of these false theories has seriously impaired their social efficiency. When vocational education came into the school program, every step in its development was faced with the question as to whether it would accept the philosophy of the general schools or whether it would work out a philosophy radically different. In this chapter it is proposed to deal with the theories which have been developed by workers in the field of vocational education as this work has progressed.

Characteristics of vocational education—In taking up this discussion the reader must constantly bear in mind the object of vocational education. Quite aside from their faculty psychology, the general schools give, as they should, much attention to teaching appreciations of socially desirable things. In following faculty psychology they also give, as they should not, too much attention to formal disciplinary subjects. On the contrary, vocational education only functions in proportion as it will enable an individual actually to do a job. From the standpoint of theory, therefore, appreciation as an end in itself finds no place in the field of vocational education except in so far as interest and understanding are primary factors in learning to do.

Whatever may be said as to the undoubted value of the possession of appreciation and of information, vocational education must establish habits: habits of correct thinking and of correct doing. Hence, its fundamental theory must be that of habit

psychology. It is only through the establishment of habit by repetitive training that capacity to think or to do in the field of production is developed. For that matter, this is equally true as to all human performance, mental or physical, in every field. No matter how much a man may appreciate the importance of a job, if he lacks the habits of thinking and the habits of doing which it requires, he is of no use as a productive, economic or social factor on that job. On the other hand, it is quite safe to say that pronounced success in doing any work indicates some appreciation of it both as an incentive leading to its selection and mastery, and as a by product of understanding and proficiency. Only those who like tennis or fruit growing become successful in these activities.

Vocational education as it developed has been introduced into or grafted on to a thoroughly organized general system of schools already in operation. It is not surprising that considerable confusion has arisen and that many attempts have been made to give vocational education on the basis of faculty psychology and the theory of formal discipline. This was particularly true in the earlier stages of the new movement for practical training in this country. It took some time to discover that some subjects, such as mathematics and science and drawing as taught for mental discipline in the general schools, do not function effectively in vocational training. This was equally true with regard to the organization and procedure which lends itself so easily to the administration of the general school. Out of these differences in the theories and practices of general education and the requirements for effective vocational training to meet the real demands of employments, have grown controversies not as yet finally adjusted.

Since vocational education is essentially a matter of establishing certain habits through repetitive training both in thinking and in doing, it is primarily concerned with what these habits shall be and how they shall be taught. When we consider the

matter a little further we find there are three general groups of habits required: 1. habits giving adaptation to working environment; 2. process habits; 3. thinking habits.

Environment habits—Every employed person works in a certain environment. This environment is determined by the conditions necessary to get the work done. Some of these are physical, such as the tools and the machine with which he works and the place where he works. Some of them are mental or personal, such as the kind of fellow workman or foreman or the kind of relations that exist between him and them. Whatever this environment may be, he must adapt himself to it or lose his job. He must punch the time clock if that is required. He must get along with his foreman even if that foreman be somewhat violent in his language at times. He must meet the conditions as to general behavior which are expected of all employees of the concern. In proportion as he has to acquire these habits after he has entered employment, he is at a disadvantage.

Hence, what may be called the *first general theory of vocational education* may be stated as follows: *Vocational education will be efficient in proportion as the environment in which the learner is trained is a replica of the environment in which he must subsequently work.* Training on the job itself insures the exact environment itself. Training in school before going to work can only at best imitate or approximate it. This the school should do as far as it possibly can, if it expects to establish any environment habits as preparation for advantageous entrance to the real job.

This statement may require a little explanation. It does not refer to such modifications by the school as make for efficient training. It does not mean that the learner shall be assigned to jobs in an inefficient order because shops are guilty of this practice. It does mean, however, that the jobs which he gets should not be exercises but *real jobs* with *real tools* and *real machines* turning out *real products*. If the work as actually carried on

requires a flannel shirt and overalls, he should not be trained in a white shirt and white duck pants!

Process habits—Every occupation is carried on according to a series of operations, each of which is performed in a certain way. Jobs are not always standardized completely, but there is practically a best way of doing every job. In order that the learner may be effectively prepared, he must be so trained that he acquires the habit of doing each job in the proper way. Hence what may be called the *second general theory of vocational education*, may be stated as follows: *Effective vocational training can only be given where the training jobs are carried on in the same way with the same operations, the same tools and the same machines as in the occupation itself.* Obviously it is futile to train novices for an occupation on obsolete machines. Is it much less so to drill them in the performance of work by hand tools when the real occupation uses machine tools for the operation?

Thinking habits—Just as in the case of environment and process habits, thinking habits must be established of a kind which function in the occupation itself. That is, the learner must be trained in habits of thought which are similar to those habits possessed by people who have to think in the operation. In other words, the learner must not be trained to think one way and be expected to change his habits of thinking when he goes to work. An experienced baseball player is almost as helpless in tennis as a novice until he acquires thinking habits about the rules, the regulations and the plays of the game, and particularly about its etiquette or sportsmanship. Conduct regarded as entirely honorable in baseball would not be tolerated in the battle across the nets. Individual workers have to take over thinking habits about team play when they become group workers. The individual already trained at slow, refined tasks, must learn to think about rougher finish, larger output and speedier action in the modern factory. A plumber works with wood to a very limited extent in cutting holes for pipes and in anchoring

fixtures, but his whole thinking about the matter as a craftsman is entirely different from that of a carpenter. The latter constructs out of wood while the former, who constructs out of metal parts, looks upon wood only as an obstacle and often as a nuisance.

Specific habits—The theory of faculty psychology is now known to be a fallacy. With it passes also the idea of general faculties which can be trained by formal discipline into general habits of observation, apperception, memory, reasoning and judgment, for effective use in meeting every situation. According to modern psychology all habits are specific and not general. It follows that all the habits in which the learner must be trained, his thinking habits, his doing habits and the habits which enable him to conform to his environment must be specific in terms of the job and its demands.

If you want to train a golf player effectively you will do it in proportion as you are able to give him doing habits and thinking habits in golf and the habit of doing and thinking under the actual conditions of the golf game. The failure of many excellent players in competition is due to their failure to acquire the last habit, the failure of most ordinary men to become proficient, in their inability to acquire at their age the first habit. All these habits they get, however, if at all, by applying themselves to their development specifically by playing at the game; that is, by practice on the job. They certainly will never get them by reading or attending lectures or putting on a parlor floor, helpful as these may be when given to a player of the real game and they will be helpful only in proportion as they are themselves direct and specific.

There can be no such thing as a general training in any habits, except so far as those habits may be common to all occupations. Promptness, for example, is probably a necessary habit common to all employment and any one who had acquired a life habit of promptness has to this extent desirable environment habits. On

the whole, however, each occupation makes its own demands as to the kind of thinking habits, doing habits and environment habits which it expects of the successful worker. This being true, vocational education finds it necessary to discard any idea of training in the fundamentals of thinking, or of doing, or of adaptation to environment, even if it be assumed that there are any such things as these fundamentals. Instead it sets up the theory of specific occupational requirements as follows: Each occupation has its own set of equipment habits, doing habits and thinking habits. These habits carry over very little into other occupations. Therefore all vocational training must be specific in terms of the particular occupation for which the individual is to be trained. The way to make a good poultry farmer is to have him take care of a flock of poultry while you teach him the how and the why of the proper way to do his work, and to meet the various situations that arise to which he must apply skills and knowledge intelligently. You will never do this as a teacher with long courses in either mathematics or zoölogy or for that matter with general books on farming! This leads us to a *third theory* which is that *vocational education will be effective in proportion as it trains the individual directly and specifically in the thinking habits and the manipulative habits required in the occupation itself.*

Special aptitudes and interests—The general school pays but little attention, or, according to its theories, at least need but pay little attention to aptitudes and interests. Especially is this true if the school is still operating trustfully on the theory of general faculties and general habits, good when trained, for any situation. All that needs to be done is to patch up any individual where these faculties are weak. Vocational education, on the contrary, finds it necessary to accept the theory that different individuals possess special aptitudes and interests which must be considered if their training is to be effective. In training for the performance of jobs we must face the facts that individuals differ

in intrinsic intelligence, differ in their interests and differ in their aptitudes. Efficiency in training will be secured only as we provide for each individual the kind of training which corresponds with his interest and aptitudes and will enable him to capitalize his intrinsic intelligence, whatever that may be, to best advantage.

This *fourth theory* may be stated as follows: *Vocational education will be effective in proportion as it enables each individual to capitalize his interests, aptitudes and intrinsic intelligence to the highest possible degree.* Money and effort are wasted whenever the attempt is made to teach any youth a trade or occupation or profession which he does not like or for which he lacks the traits and aptitudes necessary for success or whose thinking demands he can never meet because his native ability is too low. This theory is commonly expressed in the phrase, "ability to profit by the instruction offered," which is so often found in State Acts as well as in the National Vocational Education Act.

It will be noticed that in setting up this theory, vocational education runs squarely counter to the theory on which most general schools are operated. The general school assumes that the education which it offers is good for everybody and that everyone can profit by it and therefore should take it or nothing. Vocational education is forced to assume that, since its education is specific, only those individuals should be given any given line of training who are able to get from it the skill and knowledge which makes the training socially worth while.

This gives us the *fifth theory* that *effective vocational education for any profession, calling, trade, occupation or job can only be given to the selected group of individuals who need it, want it and are able to profit by it.* Some school men are not yet convinced that it is futile to train a boy for meeting college credit requirements and at the same time try to fit him for a trade. Nor do they recognize, apparently, the misuse of public funds on instruction he will not use and does not expect to use.

Repetitive training—Vocational education is, in its pedagogy, based squarely upon habit psychology. The formation of habits depends upon repetitive training. The habits established are not of value until they have become firmly fixed. Therefore, it is necessary in vocational education that the habit forming experience should be repeated sufficiently to form permanent habits. This leads to the *sixth theory* that *vocational training will be effective in proportion as the specific training experiences for forming right habits of doing and thinking are repeated to the point that these habits become fixed to the degree necessary for gainful employment.*

Merely sampling experiences in wood working or in any other occupation may serve to discover a pupil's interests and bent with regard to those special occupations at the time that the sampling is done. Intelligent skill in carpentry, or in any other occupation, however, must be built up by repetitive experiences in its operations and processes. Specialized workers of every kind gain by repetitive practice a high degree of skill in the performance of activities repeated so often they become automatic or semi-automatic. This is just as true of the great surgeon who confines himself to one kind of operation as it is of the linotype operator or tinsmith, and it applies both to physical habits or hand skills if such they may be called, and to mental habits in the use of technical knowledge for guiding these skills. Both are the results of repetitive practice in doing the thing itself and thinking about the doing.

Experienced instructor—Vocational education is a social device for rapidly and efficiently developing specific habits as to environment, thinking and doing with regard to a specific occupation. These habits must be secured under the supervision, direction and instruction of somebody. That somebody must himself possess those habits in a sufficient degree to meet occupational requirements. In the field of vocational education the only person who is competent to instruct and train is the individual

who has himself had habit formation experiences, who is himself a master of his craft and has acquired his equipment habits by going "through the mill."

It will be noted here that in setting up this demand for occupational competence in the instructor, vocational education in a number of ways runs counter to the practice of the general schools. Under the present method of training teachers for the high school, for example, a teacher may take up some subjects bearing very vitally on matters of life without having had any experiences in them himself. This is perhaps especially deplorable in the teaching of civics.

As a working principle which has found wide acceptance in State and National legislation regulating vocational schools we have the *seventh theory* that *vocational education will be effective in proportion as the instructor has had successful experience in the application of skills and knowledge to the operations and processes he undertakes to teach.*

Minimum employment standards—Obviously the value of vocational education depends upon the ability of the individual to use his training in gainful employment. If he cannot secure and cannot hold such employment, his training is evidently of no value either to himself or to Society. This contingency will happen unless his training has been carried to a point where he has an asset in skill and knowledge that can be sold to an employer and is expressed in what may be called the *eighth theory* or *theory of minimum employment standards* as follows: *For every occupation there is a minimum of productive ability which an individual must possess in order to secure or retain employment in that occupation. If vocational education is not carried to that point with that individual, it is neither personally nor socially effective.*

This theory may require some illustration: Suppose a boy were being trained for machine shop work in a certain community where only those able to do at least certain kinds or grades of

machine shop work are admitted. He need not be a complete machinist, but he must be able to render certain services efficiently if he is to be employed in the occupation at all. If he cannot do this, he will be employed on a philanthropic basis as a "prospect" or he will not be employed. It should be noted here that this point of minimum employment standards naturally varies with the occupation and with local practice and that in occupations having apprentices it need not mean the completion of full apprenticeship training before employment. According to this theory, however, whatever this point of minimum employment may be, the individual must be able to meet the minimum requirements as a result of his training or the training is of no employment value.

Training to market requirements—Every occupation is carried on in a certain way. This may not be regarded as the most desirable way, but it is, in fact, the way in which the occupation is conducted. If individuals are to be trained so that they can secure and hold employment, and so succeed productively, these "market demands" must be met.

To take an extreme case, suppose the training of girls in high power machine work by a school is under consideration. Suppose further that after being trained they would on entering the commercial shop be expected to work at higher speed than may be desirable from the standpoint of health, or even to work in factories where the hygienic conditions are not as good as they should be. It is quite possible to take the stand that, these facts being true, the girls should not be trained to work under such conditions. The vocational school might refuse to train them and might "stand pat" on the proposition that until the garment industry does away with these undesirable features, it will refuse to train any girls for that industry. The trouble here is that the girls do and would go into the industry anyhow. The question is therefore whether it is better to train them so that they may begin work at a fair wage and a better chance to succeed, or

whether they should be left to find their way into the industry by less desirable channels and secure their training in less efficient and less desirable ways.

What may be called the theory of market demands or *ninth theory* amounts to saying that *vocational education must recognize conditions as they are and must train individuals to meet the demands of the "market" even though it may be true that more efficient ways of conducting the occupation may be known and that better working conditions are highly desirable.*

The failure to recognize or accept the soundness of this principle has led many school men to select so-called skilled trades only for their vocational programs because of their dislike of specialized occupations at which most workers are employed, and has led to the attempt to establish all day trade schools in communities where the real mass need was for the extension training of large numbers of workers to meet the changing market demands of their employments. This tendency has been especially marked in the case of trade schools for girls, by a reluctance to deal with occupations other than the "needle trades."

The illustration of the high power machine operator just used is admittedly an extreme one, but was given designedly to consider the problem at its worst. It emphasizes the principle that the business of vocational training is not to reform occupations, but to help workers. It goes without saying that the authors do not defend but deprecate unjust or undesirable working conditions. We see no reason that would prevent any school from training these girls while at the same time it undertook in every legitimate way to get undesirable or anti-social conditions changed. Indeed all experience shows that efficient training for an occupation is one of the surest ways to do this.

The theory of job training—Coming out of the general theory that training must be carried on in the occupation environment comes this subsidiary or *tenth theory*: *The effective establishment of process habits in any learner will be secured in proportion as the training is given on actual jobs and not on exercises*

or *pseudo jobs*. An exercise may be defined as training on an operation where the entire purpose is to develop skill and give an opportunity to apply technical knowledge. Under these conditions, the product may be of no value whatever and the conditions under which it turned out may be totally different from those of the occupation itself. A pseudo job may be defined as an actual production job which is carried on in an actual way so far as knowledge and skills are concerned, but whose product is in no way utilized, and whose working conditions are not those of the occupation.

As a good example of the distinction we might consider three ways of teaching the laying up of brick between two uprights. On the *actual job* this brick would be laid on the actual building and the two uprights might be the sides of two window frames. As a *pseudo job* the two uprights could be set up on the floor of a school room and brick laid up between them. As an *exercise* the same brick might be laid as a supposed section of an indefinite unconfined straight wall in the middle of a school room floor. Evidently the pseudo job is preferable to the exercise because it does involve the carrying through of the job *by the regular operations* and up to trade standards, whereas the exercise at its best calls only for conformity to trade standards in the product.

When it is willing to do it, the commercial shop can give training in manipulative skills better than any other agency because the experiences of the trainee are always on actual jobs. When the movement for vocational education gets its tasks and its facilities thoroughly defined, this teaching and training in process habits will become largely the job of the shop and training in the acquirement and intelligent use of the special technical knowledge of the occupation will become the task of the school.

Origin of content—An *eleventh theory* is of comparatively recent acceptance in the field of vocational education. It may be stated thus: *The only reliable source of content for specific training in an occupation is in the experiences of masters of that occupation.* If you desire to find out what should be taught to

a plumbing apprentice, for example, you should go to plumbers of recognized ability and success. The same would be true of any other occupation. It will be noticed again that this theory when followed out in practice runs squarely counter to the method of developing content in the regular schools. The regular school has assumed that it can, out of its own teaching force, assisted by books, develop adequate teaching material for its purposes. The vocational school has accepted the theory that in order to secure this content, it must go to those who are actually employed in the occupation in real life.

The failure to recognize and accept this theory until comparatively recently, has been the cause of much difficulty, confusion and failure in many vocational schools. It has not been uncommon, as an illustration, to find long courses in architectural drawing required in day courses preparing carpenters, plumbers or brick layers, plasterers and painters for occupations, in none of which was there any use by the best journeymen of anything beyond the ability to read blueprints and perhaps make simple free hand sketches.

Occupational content specific—Not only has vocational education found it necessary to accept the theory that the content must be found in the occupation itself, but it has also found that this content is specific and not general for each occupation. This fact has led to what may be called the theory of specific content, or *twelfth theory* which may be phrased in this way: *For every occupation there is a body of content which is peculiar to that occupation and which practically has no functioning value in any other occupation.* According to this theory, there is little or no opportunity for common content between different occupations. This body of special content for an occupation consists in general of three kinds: First, a manipulative content; second, a specific technical content; and third, what is called an intelligence content.

The preceding statement is often represented by the so-called

Richard's formula already described in a previous chapter, that efficiency in an occupation varies directly with the worker's skill, knowledge and intelligence. As there described, the ability to do any job varies directly as skill, or the technical knowledge that functions on the job or the job intelligence of the workman are improved. It will be noted that the acceptance of this theory of specific content again comes out of the new or habit psychology and is directly contrary to the theory and procedure under the faculty psychology and the doctrine of formal discipline.

The foregoing theory may be illustrated in some such way as this. If you want to train a youth to be an efficient plumber, you must select the actual experiences in the practice of the plumbing trade that he should have and see that he gets these in a real instead of a pseudo way. This you must do to establish correct process habits. While this is going on, he should be given the technical knowledge or facts of every kind he needs to know in order to understand and guide his shop work, but such facts should be culled from all fields of knowledge and only those should be used which are of use to him as aids in his work. In order to develop his job intelligence these facts should be given him in clear, direct fashion at the time when he can best understand and use them for thinking his way through actual situations in his work. This you do to establish specific resourceful habits of thinking in the problems of the plumbing trade.

The service theory—It has been pointed out elsewhere that the actual situation in modern Society is that we have a larger number of groups of people who have varying degrees of intrinsic intelligence; who have widely varying needs; and who are able to take advantage of training for meeting these needs only under a wide variety of limiting special conditions. If vocational education is to meet the needs of all people under all these varying circumstances, it is evident that this service cannot be performed by the use of standardized courses, standardized methods, limited or uniform teaching material and standardized teaching conditions.

It is necessary, therefore, to organize the work on a totally different basis which may be called *the theory of General Service*.

This *thirteenth theory*, if put into words, would run something like this: *Vocational education will render efficient social service in proportion as it meets the specific training needs of any group at the time that they need it and in such a way that they can most effectively profit by the instruction.* This means, of course, the selection of groups, each containing only those having common specific needs, the determination of these specific needs, the setting up of working and of teaching conditions which make the meeting of these specific needs possible and the determination of the right specific content to meet each of these specific needs. The way in which, as the result of sad experience, many have come to accept the soundness of a fourteenth theory can be well illustrated by the evolution of unit courses in any subject taught to tradesmen.

Not so long ago men believed that Mathematics was Mathematics for everybody. Hence the standard course in general arithmetic, general algebra, and general geometry, analytics and calculus should be given to everybody and could be used by everybody. Consequently the first evening classes in Mathematics offered exactly the same courses found in day schools. Workers did not attend because they could not understand or use knowledge so abstract and remote from their real needs.

Recognizing this failure these courses were succeeded by others which were called "Practical Mathematics" or "Applied Mathematics" in which an attempt was made to cull out a few subjects obviously beyond the ordinary worker, but give him the remainder in the same way as before. When this failed a third attempt took the form of teaching the Mathematics lying back of certain figuring processes found when taken as a whole in the trades and teaching these in the old way to mixed groups from all these trades.

When failure again resulted, Mathematics was offered separately for each trade group as Mathematics for machinists,

Mathematics for electricians, Mathematics for carpenters, but each was still taught as one general course in the evening school. To profit by it the student from the trade or occupation concerned must enter and take the full course. In many places the work was still too general and not applied in any direct way to real shop needs. Too often it was taught by men not familiar with shop processes or ways of calculating used by tradesmen. When this failed there came the breaking up of the Mathematics for each trade or occupation into short unit courses each bearing directly on specific needs of workers in the performance of specific tasks or operations such as, for example, in the case of machinists. By arranging these units in series and duplicating them at times, it becomes possible for a worker to get instruction in any one of them when he needs it. This is real "pusher" training which, when properly carried out, reaches actual needs as shown by the marked increase in enrollment and in persistence of attendance where evening trade extension courses are so organized.

Without going into any detailed discussion at this point, it may be worth while to point out here that this "service" theory sets up extremely difficult problems in administration as compared with the ease of administration which can be secured under the present organization of most regular schools. These schools classify their students solely by their academic credits for previous work in general subjects. Therefore, such schools do not have to take into consideration any differences between students as to the special character of their employment, or their stage of advancement therein, or their special aptitudes and interests.

Group characteristics—We have, therefore, a *fourteenth theory* or working theory of group characteristics: *Vocational education will be socially efficient in proportion as in its methods of instruction and its personal relations with learners it takes into consideration the particular characteristics of any particular group which it serves.*

A very simple illustration will make the meaning of the pre-

ceding discussion clear. Considerable experience, often of an extremely disagreeable character, has taught some vocational educators that a class of mature, competent, self-respecting workers cannot be treated as if they were a group of children. In the past this has sometimes been tried with disastrous effects. Sometimes we forget that, whereas the child can be kept in school by parental authority to some extent, or by the operation of a compulsory school law, no power on earth can keep in any class any group of mature men and women unless they want to stay. They will want to stay only as long as they feel they are getting something which pays them for staying.

This acceptance by vocational schools of the necessity for recognizing group characteristics has led to profound modifications in organization, in discipline, and in methods of instruction. These facts which have only recently come to be fully recognized are discussed in some detail in a succeeding chapter. In the early days of vocational education, the tendency was naturally to follow the steps of the regular schools as to personnel relations and methods of instruction. Out of experience, however, has come wisdom.

Elastic administration—Out of the foregoing theories has come what may be called the theory of elastic administration. This theory in brief holds that it is the job of the vocational administrator so to organize and administer his work that these other theories can be carried out in practice. In other words, the administration instead of being rigid and standardized must be elastic and fluid. That this sets a most serious problem before the administrator of vocational education cannot be denied. That this theory must be carried out in practice if vocational education is to render efficient social service, likewise cannot be denied. For the sake of being specific this last or *fifteenth theory* may be stated as follows: *The administration of vocational education will be efficient in proportion as it is elastic and fluid rather than rigid and standardized.*

Irreducible costs—It has been pointed out in a preceding chapter that one of the gravest problems of the regular school administrator is the cost of the schools. He is often forced to accept working school conditions which he himself knows are not suitable for the effective carrying out of his objectives as he would have them. He most frequently, if not always, compromises between efficiency and cost. If the theories which have been outlined in this chapter have been accepted, it is evident that this principle of compromise cannot be carried out in vocational education. This would be especially true, for example, of the theory that training, if given, must be given up to minimum employment standards.

What might be designated as *the cost theory* or *sixteenth theory* in vocational education is as follows: *While every reasonable effort should be made to reduce per capita cost, there is a minimum below which effective vocational education cannot be given, and if the course does not permit of this minimum of per capita cost, vocational education should not be attempted.* As some one has aptly said to vocational educators, "Do it right or leave it alone." A recognition of the wisdom of this would have saved us from many abortive attempts to get something called vocational training done at low cost, and many American communities from the foolish expenditure of money in pseudo vocational education and in futile experiments.

Summary of Working Theories

Some important points—For the convenience of the reader there has been brought together in the following table a summary of the more important points which have been raised and discussed in this chapter. This chapter has been devoted exclusively to a somewhat formal statement of certain theories which have been accepted as fundamentally sound in the field of vocational education. As a result of their acceptance, there has grown up a

body of practices in administration, in methods of selecting content, and in instruction operations and processes as well as a general pedagogy which has found its place in the practice of this form of education as it is developed in this country. The following chapter will take up some of the more important of these shown in the following table as they have been worked out in practice.

SOME COMPARATIVE POINTS AS BETWEEN GENERAL AND VOCATIONAL EDUCATION

<i>Factors</i>	<i>General Education</i>	<i>Vocational Education</i>
Basic Theory	Faculty psychology	Habit psychology
Form of training	General faculty training	Specific habit training
Character of content	Standardized	Widely diversified specific content
Origin of content	Traditional selection	Experiences of competent workers
Environment	Isolated from life	Under life conditions
Special interest	Not regarded	Regarded
Special aptitudes	Not capitalized	Capitalized
Basis of admission	Ability to meet standardized academic requirements	Ability to profit by the instruction
Scope of service	Limited—chiefly youth	Serve all groups— all ages
Repetitive training	Little	Much
Qualifications of instructors	Know content	Hold specific occupational experience
Standards	Academic	Occupational
Objectives	Appreciation and trained faculties	Ability to meet demands of a specified occupation
Method of training	Illustrations, information, exercises, pseudo jobs	On the job
Working conditions	Practically common to all courses	Different for each course
Basis of operation	To offer a general opportunity	To meet specific needs
Leadership	General	In specific occupations
Group characteristics	Ignored	Considered
Administration	Easy, simple, rigid	Difficult, complex, elastic

A synopsis of the theories regarding vocational education—
The various theories discussed in the body of this chapter are

given below in the form of specific statements for the convenience of the reader:

An efficient plan for vocational education will have the following characteristics:

1. The training environment is the working environment itself or a replica of the working environment.
2. The training jobs are carried on in the same way as in the occupation itself.
3. The trainee is trained specifically in the manipulative habits and thinking habits required in the occupation itself.
4. The training helps the trainee to capitalize his interests and abilities to the highest possible degree.
5. The training is given to those who need it, want it, and are able to profit by it.
6. Adequate repetitive training in experiences from the occupation fixes right habits of doing and thinking to the degree necessary for employment.
7. The instructor is himself master of the skills and knowledge he teaches.
8. Training is carried to the point where it gives the trainee a productive ability with which he can secure employment or hold employment.
9. Training meets the market demands for labor whatever these may be in any given occupation.
10. Training is given on actual jobs and not in exercises or pseudo jobs.
11. The content of the training which is taught is obtained from masters of the occupation, not theorists.
12. This teaching content applies so directly and specifically to the occupation that it has functioning value for this occupation only.
13. The training needs of any group are met at the time they most require help and in the way that gives the most help.

14. The particular characteristics of those it serves are considered—both in methods of instruction and in personal relations with learners.
15. The administration is elastic and fluid.
16. The funds expended on training are at least sufficient to permit good training to be done.

Conflicting Administration Theories

It would seem desirable in closing this chapter to discuss two conflicting theories as to the most effective organization of such vocational education as is given by the public schools. These two theories are commonly designated as the system of single or unit control and the system of dual control. It is not the purpose of this chapter to advocate either system, but to point out for the benefit of the reader the fundamental differences between them and the arguments used by the proponents of each.

The theory of single or unit control—We have in this country a system of education which, in some of its phases, reaches from the Federal Government down to the local community. We have the United States Bureau of Education, each state has its Board of Education, with corresponding Boards or School Committees in every local community. The theory of unit control may be stated in this way: *The way to secure the most effective vocational education is to place its administration in the hands of the same authorities, National, State and local, as now have charge of general education.* The proponents of this theory advocate it for such reasons as the following:

First, education must be democratic. In order to make it democratic all forms of education must be controlled by the same authorities so that they may maintain a proper balance between vocational education and general education. Any separation of administrative authority will set up rivalry which will interfere with this proper balance.

Second, the regular school authorities by virtue of their experience are better equipped to deal with vocational education than a separate authority.

Third, a division of administrative authority must necessarily create class distinctions in education which are undesirable in a democracy.

Fourth, vocational education in the hands of the same administrators as general education can be carried on more economically.

There are, of course, a number of other and subsidiary reasons which appear in current discussions. The foregoing, however, may be taken as the fundamental arguments advanced by the proponents of single control. In maintaining the validity of their arguments, they point for proof to such general school administration units as the technical high school, the cosmopolitan high school and the Junior and Senior high schools, claiming that these types of schools are successfully solving the problems of vocational education and hence demonstrate the soundness of the theory of unit control.

Dual control—Over against the theory of unit control is that of dual control which may be briefly stated as follows: *In order to render its maximum service to the individual and to the State, it is necessary that the National, State and local administrative authority in charge of vocational education be distinct and separate from the corresponding authority dealing with general education.* The proponents of this theory justify it on such grounds or claims as the following:

First, vocational education has accepted the theory of the new psychology, whereas regular education is still working along the theory of the old psychology. Consequently, regular school authorities have had no experience which would aid them in dealing effectively with vocational education. Just to the degree to which the methods and organization of the regular schools have been used in vocational education, has the latter tended to be-

come less efficient. The regular school authorities, however expert they may be in the field of general education, have no experience or knowledge which would enable them effectively to organize and administer vocational education.

Second, the regular school authorities are already burdened with a tremendous number of responsibilities. As an illustration, every local board of education and superintendent of schools must deal with all matters arising in the administration of a school system which handles, in our larger communities, many thousands of children. It would be impossible for a new form of education so recently developed, so experimental, and setting up so many new and difficult problems, to receive adequate attention from an educational authority already burdened with multitudinous duties and responsibilities.

Third, vocational education must be protected, at least for many years to come, against the extreme emphasis which the regular school man lays upon training for culture. As long as this attitude exists, vocational education cannot get from such people a fair show. Hence it must be administered by authorities who are in sympathy with its aims and who attach adequate importance to its social and economic value.

Fourth, where vocational education is administered by a separate body, receiving a direct appropriation for its work, adequate funds for its support are much more likely to be secured than where the cost must be taken out of a general school appropriation.

Results of the two theories—Space will not permit any extended discussion as to how these two theories have worked out in practice. A few of the more prominent points may be briefly mentioned. The National Vocation Act in setting up the Federal Board for Vocational Education represented in a way the acceptance of the theory of dual control. Present Bills in Congress attempting to abolish the Federal Board and transfer its activities to either the Bureau of Education or to a depart-

ment of education represent the theory of single or unit control.

Within the states themselves, so far as state administration goes, we find all sorts of situations. In general, however, a number of states require the creation or designation of a State Board for Vocational Education, but this Board has frequently been designated as the State Board of Education. Consequently, although legally two distinct bodies, practically the same individuals compose both Boards. When we look at the local situation within the state, we find that most communities have designated the local school community as the local Board for Vocational Education.

Some exceptions—The outstanding example of dual control in a State is Wisconsin. Here we have as the authority responsible for vocational education, a totally independent State Board and totally independent local Boards, many of whom have an independent taxing power. A compromise situation exists in Massachusetts. The original State law established an independent State Commission for industrial education and required independent local Boards. This law was subsequently modified by the creation of a new State Board of Education, the abolishment of the old State Board of Education, and State Commission, and the merger of the duties and powers of each into the new Board. It was left optional with local communities as to whether they would operate vocational education under a separate Board or would designate the regular local School Committee as the local Board for Vocational Education. The tendency in Massachusetts, as additional communities have taken up vocational education, has been to designate the School Committee as the local Board for Vocational Education. Those communities which started vocational training under the old Act have generally continued to operate under separate Boards.

Discussion—There is very little question but what the impartial observer familiar with the facts as they exist recognizes cer-

tain very distinct advantages in the dual control plan. In Wisconsin, for example, both the State and local authorities charged with the administration of vocational education are completely in sympathy with it and feel a special responsibility for it. The authorities are vested with a specific tax levying power. Consequently, funds are available quite independent of what may be appropriated to general education. Wherever the general school authorities feel strongly that the only important thing in education is the preparation of every one for college, or wherever the schools are still operated and conducted completely under the faculty psychology, an independent administration of vocational training would make for decidedly greater efficiency.

While the rapidly growing budget of the public schools makes it difficult for school authorities to secure adequate funds for conducting effective vocational training, there is no question that an independent authority dealing directly with state legislators or local authorities is often in a much better position to obtain them. It must be mentioned incidentally, that wherever a city government has dealt directly with a local and independent Board for Vocational Education, it has *always* shown itself ready to provide adequate funds quite independent of its attitude toward the general school appropriation.

In reality, any discussion of unit versus dual control of vocational education is virtually an academic one. The American people have—with the single exception, broadly speaking, of Wisconsin—committed the problem to the regular public schools of the various states and local communities. Students of the issue will watch with interest in the next decade the results secured in the Badger State as compared with those in other Commonwealths. Of one thing we may rest assured. Vocational training is a job to be done somehow. Some of it the schools can do and must do. Most of it employers can and must do. If the schools meet their responsibility and opportunity satisfactorily, well and good. If they do not, we may expect to see the

work done under some other form of public organization in the states that fail.

It will be noted in the preceding discussion that the real question as between single and dual control turns upon the attitude of the controlling authorities. There is no fundamental reason why any local School Committee which believes in vocational education, is willing to provide the necessary and competent teaching staff, and is able to secure necessary funds, should not conduct effective vocational training for its community as well as any special or independent Board. It is evident, however, that more effective social results would be secured through an independent control of vocational training in any community where individuals on the regular school Board are strongly opposed to this new movement, or where the local Board and superintendent of schools, knowing very little about it, are ignorant of the conditions that are necessary to make it efficient, or where the practical arts staff of the regular schools are given charge of the new work without sympathy with it and with a vast ignorance about it.

The general opinion of students of vocational education appears to be that in many states and in many local communities at the present time vocational education would function far more efficiently if it were conducted under independent State and local Boards or Commissions. These unsatisfactory conditions, however, they regard as a temporary phase which in the course of time will pass. Ultimately it will be found possible for one local educational authority to provide adequately for all the training of every kind needed by all the people of the modern democracy. That blessed day will come only when American education becomes, both in practice and theory, a truly democratic agency for the adjustment of all the children of all the people and of all adult people as well, to the changing economic and social demands of a dynamic and democratic society.

QUESTIONS

1. Assuming the 16 theories as to what constitutes efficient vocational education to be sound, in order to determine the extent to which it is real vocational education, apply these theories to the mechanic arts course of your local high school or of any secondary school. Rate this course from 0 to 100 on each of these points, or more roughly, from A to E.
2. Do the same thing with your local technical high school or any technical high school.
3. Do the same thing with the commercial department of your local high school or of any high school.
4. Take the typical book course in secondary agriculture and rate it in the same way on these theories.
5. Apply them also to each of the following: Any Smith Hughes all day schools with which you are acquainted or whose catalogs you obtain; a Smith Hughes day course in agriculture at a consolidated high school.
6. What changes, if any, would you make in these ratings for an evening extension school in the trades and industries? In agriculture?
7. What changes, if any, would you make in any of these ratings for a part time extension school in the trades and industries? For a part time school in agriculture?
8. Take the typical high school course in the household arts and rate it on all these theories. Do the same with a Smith Hughes day course in home making. With a Smith Hughes evening extension class in home making. With a part time class in home making.
9. If unit control in education must be obtained at any cost, why not carry the principle to its logical conclusion by some of these policies: 1. Abolish all private schools and colleges; 2. put the public school system and all normal schools directly under the administration of the University; 3. put the University and the normal schools directly under the authorities of the public school system of the State; 4. prevent business, industry and agriculture from training their own employees and require that the public schools should do it, if done at all.
10. To what extent is unit control a sentiment rather than a vital factor for social ends?
11. Has the cosmopolitan high school been a success in preparing youth for economic efficiency? For social efficiency?

BIBLIOGRAPHY

Bulletins of the Federal Board for Vocational Education.

- No. 52 Trade and Industrial Series No. 13. Theory and Practice of the Machinist's Trade. Prepared by Charles R. Allen and Frank Cushman.
- No. 57 A Survey and Analysis of the Pottery Industry. Prepared by Harry B. Smith.
- No. 69 An Analysis of the Railway Boiler Maker's Trade. Prepared by Frank Cushman in cooperation with foremen and others of the Santa Fé Railroad System.
- No. 74 Analysing a Potato Enterprise. Prepared by C. H. Schopmeyer and A. P. Williams.
- No. 75 Analysing a Poultry Enterprise. Prepared by C. H. Schopmeyer and A. P. Williams.
- No. 88 Analysis of the Management of a Farm Business. Prepared by Schopmeyer, Williams and Spellman.
- No. 95 An Analysis of the Bricklaying Trade. Prepared by George A. McGarvey.

The above bulletins are of interest in connection with the discussions and statements made in this chapter. They give the results of an effort to learn the specific content of occupations from those already employed in them. A comparison of this content as given in the different bulletins will show the extent to which different occupations contain common content.

These bulletins can be secured either through the office of the Board or from the Superintendent of Documents at a nominal price.

- No. 62 Instructor Training. Prepared by Charles R. Allen.

Indicates briefly the kind of teacher training found desirable for use with prospective teachers who are occupationally competent. A comparison of the content with the content of standard training courses for prospective teachers for general schools will indicate its special character.

- University of California. Trade and Industrial Series No. 3. An Analysis of the Plasterer's Trade. Melville S. Lewis.

This analysis is of the same type as the bulletins of the Federal Board listed above and is of interest for the same reasons.

CHAPTER IX

TYPES OF VOCATIONAL SCHOOLS

The previous chapter stated briefly a number of theories which have been generally accepted by vocational educators. Increasingly, these principles are being used as a working basis for the organization and administration of the work and for the content and method of its training activities. It is, of course, evident that all of these theories are derivatives of the theory of habit psychology. It is, of course, equally evident that any system of educational training derived from the new psychology and its working theories or tenets must differ radically in many ways, in fact in almost all ways, from the standardized administration and methods of schools based upon faculty psychology, the doctrine of formal discipline and the corresponding theories and tenets derived therefrom. So far as space permits, this chapter will consider the more important ways in which the working theories of vocational education described in previous chapters have been applied in practice.

Kinds of vocational education—In following any such discussion as proposed in this chapter, there is considerable danger that the reader will have in his mind some one form of vocational education, forgetting that vocational education as considered here means any group of experiences organized for training an individual in any gainful occupation. It will be noted that this definition is broad enough to include all the employments of modern society by which men and women earn their bread. It includes the entire range of gainful occupations from the professions on the one hand to the training of the unskilled laborer or the auto-

matic machine tender on the other. Since, however, most training for the recognized professions is now given by the engineering colleges and the graduate schools of the University, it has seemed wiser to confine this chapter to vocational education of less than college grade.

Vocational education is vocational education—It has become customary to recognize in the total field of vocational education at least four kinds or divisions: agricultural, commercial, industrial and home making. This is the classification set up in the National Vocational Act and has been generally accepted. In the past there has been an unfortunate tendency on the part of specialists in these different fields to feel that they had but little in common. The problem of how to train women for the effective management of the home has been regarded as radically and essentially different in every way from the problem of how to train men to be managers of industrial plants, offices or farms. This feeling has been largely due to a clear recognition of the wide difference in the skills and knowledge required for jobs in these different fields.

Unfortunately, however, neither the common elements in managerial duties nor the use of common policies and methods in training have been recognized. As the specialists in different fields of vocational education have more and more gotten together, however, it has appeared that the general tenets or working theories described in the previous chapter apply equally well in all fields. It is, of course, true that when we come to consider minor details of organization, administration and working conditions, we find differences due to certain special requirements for successful training in each field. In general, however, it is becoming generally accepted by all workers in the field of vocational education that vocational education is vocational education, regardless of whether it deals with agriculture or industry, or any other phase of economic activity, even including the professions. This being true (unless some specific statement to the

•

contrary is made), the reader will understand that the statements and discussions of this chapter cover points which are common to all forms of vocational education of less than college grade.

Organization—It was pointed out in the last chapter that effective vocational education must recognize varying interests and aptitudes; must provide a general service for all having a common need for any given training; must be elastic and fluid in its procedures and must provide for a cost of training sufficient to fit for minimum occupational requirements. The working out of these theories in practice has led to the development of certain schemes or plans of organization for schools and for activities within these schools. Among the most important characteristics of this organization are the types of schools and the use of the short unit course.

Types of schools—If the theory of general and impartial rather than limited and preferential service is to be worked out in practice, we evidently have two distinct groups whose needs must be considered: First, the group who have not yet entered into the employment for which they desire training. Second, the group who have already entered into employment and who wish further training either to improve themselves in their present position or to secure promotion. From the standpoint of organization, these two groups are in general served respectively by the full time day school and by some type of extension school. Each of these two fundamental kinds of schools has been developed in a number of ways to meet special situations.

The full time day school—The sole purpose of the full time day school is to give an individual a complete or a partial training for the subsequent pursuit of a gainful occupation. It assumes that while attending school the learner can and will give his entire time to instruction. In this, it, of course, parallels the high school.

In theory, the full time day school assumes the responsibility of giving its students at least the minimum environment, manipu-

lative, and intelligence habits required for the successful pursuit of a specified occupation. Roughly speaking, it undertakes to give the equivalent of an apprentice training or, at least, of a large part of such training. In general it is designed to serve youth over 14 and under 18 years of age. Paralleling in its age groups the regular high school, it was originally established to give a four years' training. As the full time day schools have developed, they have learned by experience that less than a four year course is desirable in preparing beginners for most employments. This situation has been met in most cases by offering two year courses. Usually, the age of admission has been raised as the length of the course is shortened. Neither scheme has been wholly satisfactory, but on the whole the shorter course has given better results.

The problem of the full time day school—The fundamental responsibility which has been assumed by the full time day school is to give training in all three of the elements of the Richard's formula; that is, as described in the last chapter, in manipulative skill, functioning knowledge and job intelligence. In common language, the school for each occupation taught must give both shop work and related subject matter.

The split program—Theoretically, the full time day school gives only vocational training. All schools of this type under public control, however, give in addition a certain amount of general education and of civic training, so that they conduct what is commonly called a "split program." So do all privately endowed vocational schools. If we take the program of a typical school of this type we find that the obvious or declared objectives of the various courses of study fall into five groups as follows:

1. Provision for the establishment of the necessary manipulative habits. This is done through shop courses giving participating experiences in the processes of the occupation.
2. Provision for equipping the learner with the necessary specific technical knowledge. This is commonly designated as trade knowledge. In class, and sometimes in the shop also,

the specific mathematics, science, drawing, or art is taught that is required in the occupation or trade.

3. A group of subjects whose objective is to give additional technical equipment or manipulative experience, not absolutely required of the ordinary worker in the occupation or trade. These subjects are added, however, either because of their promotional value or because they are regarded as being an additional asset to the worker. In this group, commonly designated as general vocational subjects are included all such courses as applied science, mechanical or architectural drawing and trade or industrial mathematics, science or applied science.
4. A group of subjects whose objectives are the promotion of civic intelligence, such as civics, or economic and industrial history.
5. A group of general educational subjects such as English and general mathematics.

It is evident that the first three groups of subjects constitute the real vocational program, the civic and the general educational subjects being strictly comparable in their objectives to similar subjects given in the ordinary high school. Since the school is primarily vocational, the major part of the time is given to the strictly vocational program which usually calls for about 85% of the instruction.

As already pointed out, the full time school is responsible for conducting a program which includes related subject matter, general education and civic objectives, as well as shop training. Evidently shop training can be effectively given only in some kind of a shop, whereas the remaining part of the program can be given more or less effectively under school conditions. The problems of the all day school, therefore, fall into two distinct issues: first, how to provide the most effective shop training; and second, how to provide the most effective training in the other parts

of the program. In working out these problems, we find that these schools have been organized in a variety of ways, but all of them can be grouped or classified as either the one or the other of two types of schools: the cooperative or the non-cooperative.

The cooperative type—If the theory that the best training is given in the occupational environment and under the occupational working conditions is to be most effectively met, this training should, whenever possible, be given in the occupation itself. This type of school is therefore based upon the proposition that the shop experiences of the students should be obtained in the occupation for which they are being trained, and that the other parts of the program should be given in the school. Under such an organization, students rotate between the actual production shop, farm or home and the school on some alternation or division of time. The most common time division is "fifty-fifty." A week in the occupation is followed by a week in the school. Other time units have been used, especially in certain engineering schools. It is evident that this type of school requires active cooperation on the part of the occupation itself, hence its name.

The scheme or plan is also called the cooperative plan for the same reason. It is also known as the Schneider plan because it was originated by Dean Schneider of the University of Cincinnati. Because it has been used extensively by him in that city, it is also called the Cincinnati plan. Usually this cooperative type of school is classified as a part time rather than an all day school because the student divides the time between school and works for wages. We have chosen to consider it as an all day school for these reasons:

1. Usually the student is placed on the job by the school.
2. He is regarded as a student at work rather than as a worker at school.
3. While he has made an entry into the occupation, he is still a student of the school for the purpose of learning.

4. The whole scheme is an effort to secure a controlled experience in the occupation for students of the school.
5. The commercial plant is only a substitute for the school shop for training purposes.
6. In essence, therefore, the difference between the cooperative and non-cooperative school would virtually disappear, if the latter paid the student for his work in the school shop, as has been done in some cases.

The difficulties—Theoretically, there is no question that the cooperative type of school is the most efficient. It puts the student into the real environment of the occupation, and trains him on real jobs under the working conditions which prevail in that occupation. Without doubt, also, it is the most efficient type of organization in practice where satisfactory cooperative relations can be set up. Experience, however, has shown certain fundamental difficulties which up to this time have not been entirely overcome. Among the most important of these is the difficulty of carrying on an effective training program in any organization or in any occupation conducted for the purpose of production. The conditions which make for the most efficient production do not make for the most efficient instruction.

A few illustrations will make this point plain. In order to secure efficient instruction, a learner should be taken off a given piece of work as soon as he has learned to do it, and should then be put on work which he does not know how to do. From the standpoint of efficient production, he should be kept on the job which he can do. This difficulty, of course, has been one of the most serious in apprenticeship training. Efficient instruction calls for the assignment of the learner to jobs in an order so arranged that all his job experience up to a given point will assist him in mastering the next job. The most efficient production order is to use the worker where his service is needed the most, according to production demand. It is evident in both these cases that we

have two diametrically opposed situations which up to the present time are almost impossible fully to reconcile in actual practice.

Efficient production requires that all machines or processes be constantly manned by a full quota of workers. Time off to go to school for instruction interferes with this program. This difficulty has been solved in a very shrewd way by the use as a device of the "double headed learner" or "two boy plan." Under this plan, learners are handled in pairs, one of the pair always being in the occupation, the other in the school. In this way, roughly speaking, half the total registration of the school is working in the occupation and the other half in the school.

The non-cooperative type—Recognition of the difficulties outlined in the previous paragraph and a number of others of minor importance has led to the establishment of many day schools on the theory that the school should operate its own shops where production can be made subsidiary to training. This type of school may or may not use the device of the double headed learner, but, as in the case of the cooperative school, there is, of course, an alternation between shop and class room plan. Since the school operates its own shops, however, it can control the whole question in any way that it sees fit. In conformity with the theory of training on the job, the best of these schools conduct shops which are, as far as possible, replicas of commercial shops or of practical homes or of actual farms as the case may be. Admittedly the shops of many all day vocational schools do not reach any such standard.

Difficulties—While of a different character from those of the cooperative school, the difficulties are still very real. One of the most important of these is the impossibility of securing occupational conditions in the school shop. The relation of a student to a teacher, for example, can never be exactly that of a worker to a foreman. Grave difficulties have been found in keeping such school shops supplied with actual up-to-date equipment and in turning out real commercial products that meet market demands

as to speed, in production, quantity of output and quality of goods. Another difficulty which has seriously affected the non-cooperative school has been the fact that it has, as a rule, provided no means whereby learners can earn money during the process of training. This opportunity is provided in the cooperative school.

Comparison—While schools of both types are doing work of all grades of excellence, it is still an open question as to which type is the more efficient. Personally, we are of the opinion that co-operative schools as a whole are getting much better results than non-cooperative schools taken as a whole. It is, of course, needless to point out that the self-contained school is much more expensive than the cooperative school, even if, as should be the case, the value of the products turned out makes a considerable offset to the cost of the additional equipment and of the floor space required for school shops.

Since many boys and girls who go to the vocational school are living under pinched economic conditions, the number who can be reached and served will always be small unless they can be afforded some opportunity to earn money. There is no inherent reason why this cannot be done in a non-cooperative school. In fact, it has been done very successfully. The traditional idea that no one should be paid anything for work done while attending a public school has, however, limited the use of their plan.

Some typical schools—Space will not permit any description of actual schools representing these two types. The reader who is interested can secure detailed information, if he so desires, from authorities in charge. Probably one of the best of the cooperative schools is that conducted by the city of Beverly, Massachusetts, in cooperation with the United Shoe Machinery Company. A school on the same general plan is conducted at East Hampton, Massachusetts, by the public schools in cooperation with the American Optical Company.

Excellent examples of the non-cooperative type of vocational school will be found in numerous localities. The fact that the fol-

lowing are mentioned does not mean that there are not others equally good as types: They are mentioned because they illustrate certain minor variations in organization, methods and administration, and so constitute variants under the general type. The Trade Schools for Boys at Worcester, Buffalo and New Bedford; the Manhattan Trade School for Girls, New York City; The Girls' Vocational High School, Minneapolis, Minnesota; the Girls' Vocational High School, Kansas City, Missouri; the Delgado Trade School, New Orleans, Louisiana; the William Hood Dunwoody Industrial Institute, Minneapolis, Minnesota; and the Vocational School, Stockton, California.

Comment—Very few people realize that any given type of school will be successful only under certain conditions. To secure the most desirable results, the cooperative school must not only have the cooperation of all concerned; it must also be able to establish and maintain effective conditions which make the shop work effective and enable it to be correlated or "tied up" with the school work. Where students have to be scattered among the occupations of many different industries or occupational units, or many kinds of commercial work, it is very difficult for them to secure a sufficient uniformity of experience to provide effective correlation.

One of the authors visited a school of this type which was attempting to handle in one class on related subject matter, boys who were employed in thirteen different plants ranging from high grade machine shops to textile mills. It is evident that, under these conditions, the difficulties encountered in setting up functioning content for the group as a whole, or in dealing effectively with students having such diverse experiences were almost unsurmountable. There could be no common experiences in the occupations of the students that could be used as the basis of class work. Consequently, there could be no effective correlation between the classwork and the job. To a very great extent, this would also be true wherever students in the same occupation are

scattered in small numbers through numerous factories, offices, farms or homes.

Experience has indicated that the best conditions under which the cooperative school can be established are found when all the students who are being trained for any one specified occupation are placed in one occupational unit, that is, broadly speaking, under the same employer. The fact that this has been possible at Beverly and East Hampton accounts for the marked efficiency of these schools, and of other fortunate cooperative schools as well. It should be noted that this statement regarding one condition as a success factor is made entirely without reference to the efficiency of the instruction itself in any school.

The economic function of the day school—Whether it be cooperative or non-cooperative, the function of the day school is to train individuals for occupations previous to their entry as independent workers into these occupations. Such schools cannot be used as job or trade changing schools. An individual who is following one occupation for a living cannot at the same time secure from the full time day school training for another line of work. The reason is, of course, obvious. If he is to give his full time to instruction, he cannot give his full time to work. Up to the present these schools have concerned themselves almost entirely with training for the skilled trades. There is no fundamental economic or social reason why this should be done.

The strongest advocates of the full time day school, whether cooperative or non-cooperative, must admit that it can never become a serious factor in promoting the broad aims of vocational education described in previous chapters. This is not because such schools cannot do good work and have not, in many cases, done good work. It is because at no time can they reach more than a very limited number of people. They can only deal, in fact, with the margin between the group that goes to high school on the one hand, and the group that goes to work on the other. This margin is small and must always be small. Hence, far more

important from the standpoint of the welfare of democracy are the extension schools which deal with the great mass of people already employed.

The extension school—As the name would imply, this kind of school has been established to give to those who have left the full time day school or have gone to work without having attended such a school, an opportunity to extend their vocational education in some way. In general such schools may be classed as part time, evening or dull season.

The part time school—This type of school takes its name from the fact that the group served spend part of their time at work and part of their time at school. This distinguishes it sharply from the full time day school which assumes that the individual is not engaged except as a student during the period of school attendance. In general, part time schools deal with employed young people who belong to the same age group that is also served by the full time day school, regular or vocational. Roughly, this group is over 14 and under 18 years of age. Most wage earners under 16 years of age are employed on jobs of a more or less casual character. These offer in many cases little or no opportunity for promotion to more responsible jobs. As a rule, they terminate as employment for the youth when he ceases to be a juvenile. This point may also be designated as the point of really efficient entrance into more permanent and therefore more desirable employment.

The age range for these jobs varies of course with occupations. It is probably most marked in industry where it is roughly from 14 to 16 years, and probably least marked in agriculture and commerce. The members of this group are employed in so-called juvenile jobs. After a longer or shorter period of employment, usually accompanied by considerable shifting about from one such job to another, they finally secure work in a pursuit which offers better wages and which they can pursue, if they see fit, as a life work. The point at which this final change of job occurs is

the point of "effective entrance" into the pursuit which is finally followed. From that point on, the individual can, if he will, progress within that line of employment.

The continuation school type—This situation has given rise to two types of part time schools dealing with employed youth. First, there are the schools for young people employed in juvenile occupations. These schools may be and often are designated as continuation schools. This term has been borrowed from the Germans who looked upon this type of school as a device for *continuing* the education of all employed workers. It serves with us better if we look upon juvenile workers as *continuing* to seek, during their juvenile wage earning period, for the better job that becomes possible when they reach the "age of efficient entrance into employment." When the term is used to defend the proposal that the continuation school shall continue to teach regular academic subjects in the regular academic way, the phrase is misleading. The more widely accepted phrase is *general part time school* which describes them as they really are: part time schools giving general preparation for any or all needed phases of social adjustment.

The trade extension type of part time school—The second type deals with young people still within the full time school age group who desire further training either to equip themselves better for the job they hold, or for promotion to a better job in the same line. Perhaps the clearest illustration of this is furnished by the great number of public school classes held during working hours for the instruction of apprentices in a great variety of trades and occupations. Salesmanship classes for the clerks of department stores provide another. Here and there through the country, such classes in special agricultural subjects are even being operated for employed farm boys.

We have, therefore, under the nomenclature adopted in this chapter, the part time plan by which the youth divides his working day between the pursuit of a gainful occupation and school.

This plan includes both the general part time or continuation school dealing with those following juvenile employments, and the part time trade extension school dealing with those who have successfully passed the point of effective entrance into a permanent occupation, as in the case of apprentices.

It has already been pointed out that the full time day school aims to give an occupational training preceding employment; that the part time school aims to give training subsequent to employment, but that both types of schools serve the group who fall within the province of the full time day school, whether high school or vocational school. In other words, the continuation school and the part time trade extension school serve the group who could, if they so desired, legally continue to attend the full time day school; for whom, in theory, provision in such schools has been made; but who have, for one reason or another, left the full time school and gone to work. It needs no argument here, therefore, to establish their right to the help of the part time school.

It may be well, however, to call attention to the fact that the per capita cost of part time education is less than one third that of full time education. Consequently, the opposition in some quarters to the cost of part time instruction is insincere and selfish. This type of school, aside from the fact that it is extremely efficient when well conducted, is, in the last analysis, the most economical way for the state to discharge its obligation to that larger part of the adolescent group for which it has, as yet, made such pitiful provision.

The evening extension type—The second employed group whose needs must be served are those workers whose maturity places them beyond and outside of the group served by the continuation school and the part time trade extension school. Members of this group have not only secured effective entrance into industry, but, as a whole, are pursuing occupations that yield a higher income than that of young workers who are still of school

age. The age limits of this group run roughly from 18 to 50 years, although, it is obvious, no particular limit can be arbitrarily set. Theoretically, it is possible for members of this group to divide their time between working and attending school. In reality, however, this does not occur. As men and women become mature, as they assume the responsibilities of maintaining a home, and as their service becomes more valuable in employment, it is rarely possible for them to divide their time so far as the working day is concerned. Therefore it is necessary for them to secure additional vocational training by the use of their leisure time; that is, the time lying outside their working day.

In order to meet this situation, we have the evening trade extension school. The characteristic of this school, as just stated, is that it deals with individuals who put in their full day pursuing a gainful occupation and then attend school in the evening. The object of these schools is always to increase the capacity of the group served in the occupation which they follow. In other words, they are not occupation changing schools. Perhaps the best illustration of this is found in the evening classes aided by the Federal Government under the Vocational Education Act which provides that these classes are to give instruction supplemental to the day employment of the students. This avoids the futile effort to train a grocery clerk to be a machinist by admitting him to an evening class in shop mathematics for machinists, or into a school machine shop. It also insures instruction in electricity for electricians only; in plumbing for plumbers only, thus limiting its service to those groups who can, in fact, "profit by the instruction."

Traditionally, these trade extension schools for adults are evening schools. This is merely because the leisure time of most people follows the close of the working day. From the standpoint of efficiency in training, the evening is probably the worst possible time to give instruction. They can be equally well conducted at any time the worker is at leisure. New York City is

just now developing extensively, day trade extension classes for men and women who are employed during the night, and similar classes have been given in other communities. These classes are usually held in the late afternoons when the recuperated worker is fresh and active.

The dull season type—Either on account of the seasonal character of their employment, as in agriculture and many of the building trades, or on account of dull times or for some other reason, individuals often find themselves temporarily out of a job. If opportunity offers, they can utilize this leisure time for training. In a number of Northern cities, for example, where the long winters cause the suspension of building operations, part time extension classes are held for the benefit of bricklayers, plasterers, carpenters, painters, concrete finishers and other building trade groups.

Where full time day vocational schools advertise to take any man any time for any training they may offer, and when they make their work flexible by the use of short, unit courses, they soon attract the man out of work. In one such school having a total day school registration of about 1,800 students, more than 60% of its enrollment last year was made up of experienced workers from 18 to 50 years of age. Many of them were temporarily out of work and took advantage of the chance to get the training they needed to hold a job or get promoted. About half of them had quit their jobs as the only way to get rapidly some definite trade asset they lacked, since many of them return repeatedly as jobs come and go. In expressive phrase, this school describes this whole group as "In and Outers."

The opportunity school—This discussion would not be complete without reference to another type of school which partakes of the characteristics of all of the types described in this chapter and which has become known as the "opportunity school." The chief feature of this type of school is that it aims literally to give

anybody the special vocational training that he desires; to give it when he wants it; and to make the conditions such that he can get it. If the individual can come for all day instruction, well and good; if only during intervals of employment, arrangements are made to accommodate him; if only in the evening for a few hours once or twice a week or for any number of nights per week, the needed help is provided.

Schools of this type have no pre-arranged courses of study. Instead of offering a number of courses, they aim to meet the "market demand." If a group, or even a single individual, appears asking for some specific form of training, the school aims to see that it is given, as requested.

Evidently schools of this type offer the extreme type of flexible organization and administration, but, at least in their conception of their job, they reach the widest field of service. Up to the present time, they have not been developed to any great extent in this country. Those that have been promoted are attracting much attention and study. It seems probable that their number will increase as the theories of efficient vocational education become more and more accepted and are worked out in practice. This will be especially true as more vocational schools abandon the imitation of the organization of general education and organize themselves to help all workers rather than full time long term students.

A summary—For the extension training of wage earners, the movement for vocational education has developed four types of schools: 1. the continuation school; 2. the part time extension school; 3. the evening extension school; and 4. the dull season extension school. Types 1 and 2 deal with immature young people still of the customary school age. Types 3 and 4 deal with the more mature group of men and women whose ages lie beyond those of the school group. All four types are characterized by the fact that, as distinguished from the full time day school, they deal with the great mass of prospective and mature citizens who

have left the regular day school and have gone to work. The opportunity type combines certain characteristics of all.

From the standpoint of social value, of the size of the groups which can actually be met and served, and of the immediate value of the educational training secured, it is evident that the extension school is a far more important factor in our social and economic program than is the day school. This needs no argument. As vocational education has developed, it has become more and more apparent that while the full time day school can do most excellent work in training for specified occupations or "trades," it can never reach more than a small percentage of the great mass of citizens needing vocational training service. Hence it is not surprising that we find an increasing tendency to give more attention to the extension school as a far more efficient agency for using vocational education to promote desirable social ends.

At the same time, however, it must be admitted that the growth of the evening trade extension class has been very slow. We are still in the evening school stage of the movement for vocational education. Apparently the problems of the immature student and worker have engrossed us to the neglect of the evening school. So far as evening extension classes in commercial subjects are concerned, the field has apparently been almost abandoned to the private business school. It is also true that the pronounced increase in part time work has been due to compulsory legislation, but this legislation itself is an evidence that this country now recognizes the needs, and the right to help in meeting them, of our employed boys and girls.

Comment on the chart—The data given summarizes the points made in this chapter. Necessarily, all the statements made are general and therefore are only roughly or broadly accurate. Those made for items 1 to 12, inclusive, are statements of fact. The remainder represent opinions of the writers and doubtless will not be approved by all readers. In the comparisons as to the

TABLE No. 5
COMPARATIVE ANALYSIS OF TYPES OF VOCATIONAL SCHOOLS

Item	Full Time Day School			Extension School		
	Cooperative Type	Non-coop. Type	Continuation Schl. (General Part Time)	Part Time Extension	Evening Extension	
1. Group served	Employed students	Not yet employed	Already employed	Already employed	Already employed	
2. Age limits of students	16-21	16-18	14-16	16-21	Over 21	
3. Biological age periods	Mature Adolescents	Mature Adolescents	Juveniles	Mature Adolescents	Adults	
4. Compulsory attendance	No	No	Yes	Usually no	No	
5. Aim of practical training	Preparation for full employment	Preparation for employment	Help in choosing a more permanent job	Extension of skill and knowledge	Extension of skill and knowledge	
6. Place of shop training	Commercial shop, office, farm or home	Under school roof	None except in prevocational school shops	Commercial shop, office, farm or home	Commercial shop, office, farm or home	
7. School control of shop training ..	Considerable	Complete	None	Very little	None	
8. Students self-supporting	Yes	No	Yes	Yes	Yes	
9. Time for non-vocational subjects ..	Little	About 15%	Most	None	None	
10. Amount of vocational training given to students	B	A	E	C	D	
11. Training in environment or habits	On the job	Only in school shop	On the job	On the job	On the job	
12. Reaching the mass problem	No	No	Yes	Yes	Yes	
13. Extent to which vocational training is utilized by students	A	D	—	C	B	
14. Present efficiency as a pedagogical device	A	B	E	C	D	
15. Present mass results as an economic device	D	C	E	B	A	
16. Potential mass results as a social device	E	D	A	B	C	

relative efficiency of different types of schools given in items 13 to 16, inclusive, the letters of the alphabet are used in the descending order, the letter A in every case indicating the best type, and E the poorest for each item.

A word of explanation may be helpful as to the reasons leading to the comparative ratings given the different schools. In item 13, the cooperative school is rated first in the extent to which its training is utilized by its students and the full time school last. In many cases, students of the latter never follow, as a life job, the work for which they were trained. On the other hand, all those enrolled in the other types are already on the job for which the school is training them. Because he is more immature and less steady, the boy of the part time trade extension class is less likely than the adult of the evening extension class to remain continuously in the same kind of employment. Those in the cooperative scheme are most likely to utilize the instruction they receive because this plan is used only for the highly skilled trades whose wage opportunities are attractive and because the group trained is a superior one, all of whose members have been carefully selected for extensive training and permanent service.

As a pedagogical device, the cooperative school is rated first at the present time (Item 14). While the non-cooperative or ordinary all day school has a more complete control over the whole time of its students, it lacks the shop environment, the reality of commercial processes and the appeal to economic motives enjoyed by the latter. Few part time classes have any real control over the working experiences of their students in commercial jobs while the evening and the general continuation school have none at all. For this and for other reasons considered in the chapter on the School for Adults, the evening extension class has been rated fourth. The general part time or continuation school is placed last largely because of the present confusion and uncertainty in its objectives and procedures.

In the 15th item, a comparison is drawn between all these types

as to the extent to which the training they are giving is reaching and improving occupational skill, knowledge and intelligence. Because it serves the largest numbers at the present time and because the help it gives is "pusher education," the evening school is given the highest rating. The continuation school rates last only because direct training for specific occupations is not its objective. The other types are ranked entirely with reference to the comparative numbers they serve.

The table closes with an expression of opinion as to the comparative value of these schools for reaching the mass of workers with some kind of socially desirable education. Here the continuation school receives the highest rating because under compulsory legislation, its members are already assuming huge proportions. The part time trade extension school is given second place, because, as a device whereby employed adolescents can both learn and earn, it is sure to have widespread use. For a long time to come, the evening school will provide the only opportunity for the great body of our wage earners to secure any additional education. It will probably always be the type most used to give "pusher education." Nothing additional need be said about the limitations on the enrollment of the non-cooperative school. At the foot of the list we have placed the cooperative school only because it is obviously a device which will be used only for highly skilled employments.

To all these schools, the theories apply which have been accepted in the field of vocational education. These must be worked out under the actual conditions and they must therefore take into consideration all such matters as the characteristics of the groups to be served and the special as well as general problems encountered in the organization and operation of each type. In the two following chapters this task will be discussed separately for the adolescent school and the school for adults.

.

QUESTIONS AND POINTS FOR DISCUSSION

1. Which of the theories of vocational education given in the preceding chapter do not apply to:

- a. Home economics training.
- b. Agricultural training.

Taking the list of theories as given, rate them as to their application to the four fields of vocational education of less than college grade. Use a rating scale from 1 to 10.

2. Vocational commercial education and trade and industrial vocational education train for wage earning occupations, where the minimum employment standards, and in fact all standards of performance are fixed by the employer. In home making and in agricultural vocational training, such standards do not exist. How do these facts affect the application of the vocational education theories to these four fields?
3. If employment standards must be met in trade and industrial vocational education, give reasons why it is equally necessary to train to pre-determined standards in agricultural training.
4. Make an analysis of the comparative advantages and disadvantages of a full time day school and a part time school by referring to the theories of vocational education which are given in the previous chapter.
5. Secure a description of the organization of two day vocational schools. Make a comparative analysis of them as to flexibility of administration. In doing this, compare them with respect to at least the following points and such others as you think pertinent:
 - a. Conditions of admission.
 - b. Time of admission.
 - c. Training to pre-determined standards.
 - d. Training in the occupational environment.
 - e. Use of specific occupational subject matter.
 - f. Use of occupationally competent instructors.
6. Secure descriptions of a number of vocational schools and classify them according to the types described in the text. Give, in each case, reasons for your classification.
7. Which will give the better training for an apprentice:
 - a. A full time day school training up to journeymanship.
 - b. Two years in such a school followed by training on the job.
 - c. A part time school during the entire period of apprenticeship.
 - d. Two years in a part time school followed by two years on the job with attendance on an evening school.

Assume all types of schools to be equally efficient in the work that they do, so far as subject matter, methods of teaching and flexibility of administration are concerned.

8. You are a superintendent of schools. You have to recommend to your board some type of vocational school. Your community has diversified industries, in relatively small shops. It is the center of an agricultural district.

What type of trade school would you recommend and on what grounds would you base your recommendations?

Would you recommend training in home economics? On what grounds?

Would you recommend an agricultural school? If so, of what type?

9. What are the difficulties that interfere with efficient job training in the cooperative type of school?
10. What are the difficulties that interfere with efficient job training in the non-cooperative type of school?
11. Set up, in two parallel columns, the conditions for efficient production in an industrial plant and the conditions for efficient instruction and training on jobs in the same plant.
12. Under what conditions would you recommend a vocational school of the Beverly type for agricultural vocational education?
13. What would be the factors on which you would rate the ultimate social value of a vocational school, regardless of its special field of training (trade, industrial, agricultural, home making and commercial).
14. What would be your criticisms of the opportunity type of vocational school?
15. Is it socially desirable or undesirable for a vocational school to train girls as beauty parlor workers? Why?
16. What should be the characteristics of an efficient evening extension course?
17. Should such a course give the students what they think they want or what the school authorities feel sure that they need? Why?
18. Why has not the "in and outer" plan been utilized to a greater extent in this country up to the present time?
19. Can you suggest why, on the whole, the more flexible organizations of vocational schools have developed in schools that were not a part of the regular public school system?

20. Which is the more important for social progress, to train prospective workers or to train those who have already entered employment? Why?
21. Is the obvious economy of the part time school liable to lead to its abuse? Under what conditions? How could this be guarded against?

BIBLIOGRAPHY

Publications of the Federal Board for Vocational Education.

Part Time Schools. A Survey of Experience in the United States and Foreign Countries. Bulletin No. 73. H. B. Smith and Edith McClure Patterson.

This bulletin consists of a very complete compilation of information as to different kinds of part time schools, including conclusions and recommendations. Gives a very complete picture of the situation in the United States at the time of publication (1922) and, in addition, considerable information as what had been done up to that date in a number of foreign countries.

Apprentice Education. A Survey of Part Time Education and Other Forms of Extension Training in their Relation to Apprenticeship in the United States. Bulletin No. 87. Jennie McMullin Turner. Prepared in cooperation with the University of Wisconsin.

A very complete compendium of information as to the situation with regard to apprenticeship in the United States at the time of publication (1923). Describes a large number of schools of the different types discussed in this chapter, both public and private.

Buildings and Equipment for Schools and Classes in Trade and Industrial Subjects. Bulletin No. 20. J. C. Wright.

The title is self explanatory. Includes pictures and plans of typical buildings at the time of publication (1918).

Trade and Industrial Education. Organization and Administration. Bulletin No. 17. By the Staff of the Industrial Education Service. Bulletin No. 17, Revised Edition.

The title indicates the contents.

Part Time Cooperative Courses. C. F. Klinefelter. Bulletin No. 78.

Characteristics, suggestive curricula and forms of organization of these types of schools.

Agricultural Evening Schools. Bulletin No. 89. J. A. Linke.

Gives methods of organizing and conducting evening schools and suggestions for content of courses.

Catalogs of Vocational Schools.

A considerable number of the larger vocational schools or school departments where such schools are conducted publish catalogs and other documents descriptive of the work of the schools. This is also true of a number of endowed institutions. The sort of material that could be secured from such sources is, of course, a matter of chance. The following are mentioned because it happens to be known to the authors that they have, in the past, put out material of this character. The list is, of course, only suggestive. Where such material is available, school departments and institutions are generally willing to provide it on request.

The Worcester Trade School for Boys, Worcester, Mass.

Dunwoody Institute, Minneapolis, Minn.

Wentworth Institute, Boston, Mass.

The School Department, Buffalo, N. Y.

The Holyoke Vocational School, Holyoke, Mass.

Hampton Institute, Hampton, Va.

The School Department, Detroit, Mich.

The State Trade School, Wahpeton, North Dakota.

The Del Gardo Trade School, New Orleans, La.

Publications of State Departments of Vocational Education.

Many State Departments of Vocational Education publish bulletins describing the various types of schools included in their state programs of vocational education. Obviously it would be impossible to list these publications or to indicate the value of each publication in connection with this chapter.

Among the states that publish a considerable amount of material and which might prove good "hunting ground" for the reader desirous of following further the discussion and descriptions in the text are California, Massachusetts, New York, and Wisconsin.

Commercial Education: Federal Aid. Recent Developments, Retail Selling Education. U. S. Bulletin No. 29.

Addresses delivered at the twelfth national convention of the National Society at St. Louis in 1919.

Agricultural Education, N.S. Bulletin No. 35. Organization and Administration, Supervision, Cooperation and Relationships Instruction. 1923.

This bulletin contains papers read and addresses made in the agricultural section of the National Society for Vocational Education at the convention held at Detroit, Mich., in Nov., 1922.

It gives a very clear idea of the point of view with regard to agricultural education at that time.

Trade Tests, Unit Trade Schools, General Industrial Schools, Shopwork on a Productive Basis, Teacher Training, State Supervision, Training and Upgrading of Women Workers. U. S. Bulletin No. 30.

Addresses delivered at the twelfth annual convention, St. Louis, 1919, showing the condition of thinking on these subjects at that date.

CHAPTER X

THE ADOLESCENT VOCATIONAL SCHOOL—AND ITS ORGANIZATION

The fundamental difficulty, which has hampered the development of vocational education from the start, has been a failure to recognize a number of facts set forth in various chapters of this book. The tendency has been to regard a school as a school and to undertake to put into effect in vocational schools the same traditional psychology and the same organization and methods derived therefrom as used in the general schools. A vocational school of any kind has been looked upon as a high school or college in which it is merely necessary to substitute a somewhat different content as teaching material, leaving what may be called "the machine" intact.

In short, the tendency has been to copy the regular school. In too many vocational schools this has resulted in all such inefficient practices as: the same emphasis as in the regular schools on the acquisition of facts; the same disregard for training in resourceful thinking; the same system of testing and marking as the basis for elimination and promotion; the same use of the memoriter text book lesson; the same use of the exercise instead of the job; and many other inefficient methods, devices and schemes of organization which, whatever may be their justification for the regular schools, have no place in a vocational school.

The effect of this has been pointed out in the preceding chapter where a discussion as to the salient points in regard to single and dual control was presented. It is high time for those engaged in vocational education to realize, as unfortunately many have not yet realized, that the social value of vocational education is

measured in terms of the ability of the individual to do a job; and that the ability to do this job depends upon the possession of the necessary manual skill, whatever that may be, the possession of the necessary technical information and the ability to think resourcefully in applying that information to the demands of the job. So long as vocational teachers and administrators fail to realize that the achievement of this objective in terms of specific occupations cannot be obtained through copying the organization and administration of the general school, that long will vocational education fail to serve democracy adequately and efficiently.

As one proof of the statement just made, take the marking system almost universally used by the regular schools which grades the performance and ranking of students either by letter or by percentages. This marking system serves two purposes: It is supposed to indicate the degree to which the student has mastered or secured what the teacher undertook to teach him. A grade of 70% in history, if it means anything, means that the student knows 70% of the dates that he ought to know, or possesses 70% of the political or military information that he should have. Practically, however, the marking system is used as a penalty and as a convenient defense for the teacher or administrator in dealing with difficulties caused by the failure to promote pupils or by the elimination of pupils who are considered undesirable.

This has even carried so far in many schools that the marking which—if it represents anything—represents only a percentage or grade of scholarship, is actually affected and seriously so, by behavior as measured by the disciplinary standards of the school. Under faculty psychology, the mark of 70% might be construed to mean that the faculty, let us say, of memory, has been developed to 70% of its maximum capacity, if anyone knows what that capacity is. With the discarding of the faculty psychology and the doctrine of formal discipline, however, it is really difficult

to determine what a marking system does mean in the modern general school. Certainly it means little or nothing in the true vocational school.

In copying the procedures of the general schools, many vocational schools have taken over boldly this same marking system. Suppose a vocational school is training to at least the minimum or specified employment standards of an occupation, whatever these may be. A failure of any student to meet those requirements means either inability successfully to pursue that occupation or inability to secure employment in it. Under these conditions it is difficult to see what 50%, 60%, or 70% means. Either the individual has been trained up to 100% in terms of employment requirements, or his training is of little or no social or economic value. What do we mean by 70% of a bricklayer? or a bookkeeper? or a cook? Who wants to ride behind a 70% locomotive engineer or a 60% chauffeur?

Casting aside the question of the value of such a marking system in the regular school, any practical consideration of the matter will show that the taking over of such a system into the vocational school is absurd. A student of a vocational school may only be partially trained for the occupation. He may, to illustrate, be trained in only one-third or one-half of the skills and knowledge required for full apprenticeship in a skilled trade. Up to the point, however, to which the school trains him, he must be trained 100%, if 100% means the minimum equipment necessary to secure or hold a job in that occupation. Illustrations of the futility of taking over practices and devices from the general school and using them in the vocational schools can be multiplied almost indefinitely.

The regular high school takes in a miscellaneous group of children on the basis of a grammar school diploma, and most colleges likewise admit all students to the same classes on the basis of a high school certificate. Some vocational schools still use these same credentials as the sole requirement for admission to any of the trades taught. Since the ability to profit by vocational train-

ing depends upon the intrinsic intelligence, special aptitudes, and interests of the students, such training must be given only to selected groups who need it, want it, and are fitted for it.

Any vocational school must of necessity fail to do effective work with many of its students if it admits them merely and solely because they are of the required age and present evidence that they have had the required schooling. Undoubtedly, the "easiest way" would be to set up as a sign, "Come in everybody, the water is fine," admit everybody, and assign and group all students in classes of uniform size or in some other way most convenient for administration. Convenience in administration in this case means a large waste of time and money. The results of such attempts show very plainly in the large mortality among students of some day vocational schools during the first few months succeeding their enrollment.

One other illustration of the sad results of copying the regular schools may still further develop this point. Not only does the regular school take in everybody who has succeeded in living through certain preceding academic experiences, but it admits them only at certain times, say in September only or in January as well. If all the groups needing vocational service could make up their minds in September or January that they needed it, or found themselves in a situation where they needed it, the problem of when to admit would be very simple.

Unfortunately for ease in administration, however, nothing of the kind occurs. Bill Jones decides that he will leave the general school and take vocational training. Sam Smith, who is already employed, discovers that if he can master several processes, he can earn a dollar more a day and get a better job. Neither of them come to this decision on any two certain fixed dates in the year, but only when a combination of circumstances lead to it in a perfectly natural but entirely uncontrollable way.

Organization for vocational training—If the standard organization of the regular day schools cannot be copied nor its administration practices, what are the administration practices and

types of organizations which will meet the situation? Whatever they may be they must make possible two things: First, the practical application of those theories of vocational education recognized as sound which have already been discussed, and, second, the practical meeting of required success factors in vocational education also considered in another chapter. Since the full time day school differs in a number of ways from the part time school and the evening school, a separate chapter will be given to each of the three types, this chapter being devoted to the first only.

Organization and administration of the full time day school—Since the full time day school is organized to give instruction for a period which roughly corresponds to the working day, it can, as already pointed out, deal only with the unemployed. The unemployed group, however, represents two kinds of individuals: first, the youth who has not yet gone to work and can give full time to preparatory training for some occupation; and, second, the mature worker who is for some reason out of work and can give full time to training either for his old or for a new line of employment. While the day vocational school is potentially capable of serving both the youth and the adult, it has thus far confined its attention almost entirely to the former.

In order properly to serve the needs of a community, however, the day school should really consist of two schools under the same roof, one dealing with adolescents through a relatively long, continuous period of preliminary training, and the other dealing with adults who can attend only for brief periods of time short extension courses. For convenience these two schools will be discussed separately and will be designated as the adolescent school and the adult school. The latter will be considered in a subsequent chapter on the problem of the adult workers.

The adolescent school—In conducting a vocational school or class for adolescents, regard must be given to two fundamental matters: First, the characteristics of the adolescent as distin-

guished from those of the adult; and second, the purpose of pre-employment training. The general aim of this school is to give an adolescent with all his characteristics the equipment he requires to enter and maintain himself in a specified occupation—give him doing ability in terms of “M,” “T” and “I,” sufficient at least to meet minimum occupational demands. This is the essential requirement which the organization and administration of the school must meet. While, as has already been pointed out, this type of school almost always includes in its program subjects having civic and other general objectives, these can be disregarded as far as the present discussion goes. Although the methods in these subjects used are and should be distinctly different from those commonly used in regular schools, the general organization of them need not be essentially different.

In discussing the proper organization of an adolescent vocational school, the problems to be considered can very well be listed under such points as admission, promotion, lines of training, discipline, working conditions and group characteristics.

Admission of pupils—Unlike the regular school, the vocational school can rarely depend upon receiving pupils at stated times. Where the organization of a regular school is copied, this is very often attempted. The effort is made to receive only recent graduates of the grammar schools who have chosen between the vocational school and the general high school. In this way, pupils of the vocational schools need to be admitted only at periods closely following their graduation from such schools, usually September or January, or both. As a matter of fact, however, the group needing to be served by the adolescent school comprises many boys and girls who want admission to the school at many other and irregular times. Some after attending the high school for a while decide to secure vocational training. Some go to work but later give up their juvenile jobs to get training for more permanent employment. Unexpected contingencies, such as the

death of a father, make it necessary for still others to begin at once preparation for bread winning.

An adolescent vocational school must therefore be so organized that it can receive at any time applicants with a wide margin of academic training. It would seem clear beyond debate that this situation can never be met by forming classes only at the beginning and perhaps the middle of the school year. All experience has indicated that, where boys and girls applying for admission are refused but are told to come again in September or January, they almost invariably give up the idea and go to work. Most of them can not afford to wait. If these are to be reached and served, they must be admitted at the time they desire to enter.

A vocational school should be so organized and conducted that it is able to admit anybody any time for any course of instruction it has to offer. To do this, however, the traditional idea of teaching pupils in groups only and organizing all work as class work must be abandoned, and some method be adopted of dealing with each pupil as a teaching unit through individual instruction. Obviously, students admitted at irregular intervals to classes formed at regular periods and taught by the class method only, can not profit by the instruction because it is based on so much they have missed in the course.

Obviously, too, if students are dealt with on the individual basis, each receiving from day to day what he needs next and can do next, it makes but little difference when he enters so far as the results to him go. Unquestionably the proposal to give individual instruction has been one of the greatest bugbears to the school administrator. Admittedly the method offers serious difficulties, but not because the thing itself is so difficult. It has been satisfactorily demonstrated in the kindergarten. Teachers of drawing have always employed it successfully. The Boy Scouts employ it almost exclusively. There is no other way to teach laboratory work. This is largely true also of all health and

physical training. It is probably the one method by which vocational training can ever be given in a commercial shop. Business colleges use it almost exclusively. All the shop work in most vocational schools is taught in this way. Some schools give shop knowledge to each pupil in connection with his individual projects. A few are organized primarily to admit and train individually all applicants whenever admitted.

The real trouble is that practically no agencies have existed to train teachers to instruct individuals. All the training work has been based upon the theory that all teachers are going to teach classes. Apparently our thinking about methods of teaching is based on the conception that the process can be carried on only by a tutor giving all his time to one pupil as a teaching unit, or by an instructor giving all his time to a class as the teaching unit. Little or no consideration has been given to the problem of so teaching a flexible group of pupils that each pupil as a separate teaching unit is handled by the tutorial method. Yet, as we have just seen, this method is widely used by teachers in a wide variety of subjects who have in some way learned how to use it because they could succeed in no other way.

It is easy to see why the class method prevails in the public schools of a democracy which every one attends. It is the cheapest and the easiest way to handle large numbers of pupils. It also lends itself well to the teaching of facts to be remembered. Since all are to receive and be trained to recall the same facts, the class becomes a labor saving device as this standardized information can be given rapidly and systematically to numbers of pupils at the same time. No one contends for a moment that it is the most effective way even to teach mere facts. Everybody recognizes in theory that it is the poorest of devices for teaching anyone how to do anything, or even how to think about how to do anything.

It is literally amazing to find this class or simultaneous method almost universally used in all the activities of vocational schools

outside the shops. Yet it is to be expected, since all of us were educated by it. Most of us have seen nothing else and know no other way. Most amazing of all, most of the teacher training institutions for vocational education have apparently not realized either the need for the use of individual instruction in the schools or the imperative need that teachers be specifically trained in its problems and methods.

It is not particularly difficult to train teachers to teach by individual instruction, probably not more difficult than to train them to teach by classes. General inertia and tradition have up to this time kept those agencies responsible for the preparation of vocational teachers from giving them proper training for teaching on the basis of individual instruction.

The adolescent school should be organized on the basis of admitting students at any time and should regard the teacher essentially as a master workman in charge of a group of apprentices whom he instructs and trains as individuals and not as a class. This amounts to substituting a rotating group for the formal class. This rotating group consists of a number of learners, the number usually being fixed at a certain maximum and the learners being in all stages of progress. When any learner leaves the group, the vacancy so created is filled by assigning to the group the next applicant who is desirous of securing that particular sort of training.

Conditions of admission—As has been pointed out, the conditions of admission used in the regular school are either the successful completion of the work of the previous grade or year or the successful passing of certain examinations, largely of an academic character. If the vocational school is to capitalize on interest, aptitudes and intrinsic intelligence, it is evident that this method of admission will not serve. All experience has indicated that different occupations interest different individuals and that they have aptitudes and other qualities which they can capitalize much more effectively in one occupation than in others

Therefore the adolescent vocational school must be so organized that it admits to its various courses groups selected on the basis of apparent ability to profit by the instruction.

At this time the question of how this is to be established is by no means thoroughly answered. One attempt is through pre-vocational training as discussed in a previous chapter. Another attempt has been made through the use of tests for mechanical or other occupational aptitudes or abilities such as the Stenquist test and other tests of that character. As a matter of fact, however, up to the present time the only practical plan which seems to have given satisfactory results has been to admit on trial all those who have the required minimum of general education and have shown in some way a genuine interest in the activities of the occupations they select. Those who do not succeed in the work of one specific training course are given an opportunity to transfer to another. Curiously enough, however, experience has indicated that where this is done the number of actual transfers in such schools is very small. Roughly it may be said that their interests either coincided with their aptitudes or that in some way they had found out what they were capable of doing. The first is much more likely to be the truth.

This does not happen when extraneous forces come in to affect the situation. In many cities, for example, the effort on the part of the regular schools has been to make the vocational schools dumping grounds for the mentally deficient and for other pupils who for one reason or another are not considered desirable in the regular schools. There is probably not a city in the country where the vocational schools have not had to fight this matter out with the regular schools.

This unfortunate controversy is due to a rather curious piece of confused thinking on the part of regular school teachers and regular school administrators. It is a well known fact that one of the best ways to educate mentally deficient people up to their maximum capacity is to train them through participating expe-

riences in concrete activities, that is, in doing things and making things. This method has become the standard procedure in schools for the feeble minded.

Failing to perceive the difference in the objectives, but only seeing that the vocational school deals with concrete rather than abstract things, the regular school man apparently always assumes that such a school is the place for those whom he regards as mentally deficient. Undoubtedly every community able to provide a school for the feeble minded and the subnormal should have one, but the vocational school should not be used in this way because it is not the purpose for which the school is established and maintained, nor for which the taxpayer pays the bills.

Standards of promotion—The organization of the adolescent school must provide for promotion on a basis of performance, not on a basis of time or of memory. In this whole question of promotion we have two administrative procedures. Let us assume that satisfactory education in any field is represented by "E," that the time given to such education is represented by "T" and the varying capacity of individuals to progress by "C." This gives us an equation $E \propto T \times C$. Interpreted, we have the statement that satisfactory results in the education of any person are obtained when his given capacity is trained long enough to secure required results. If we make "T" a constant, the progress of different individuals in that fixed time will vary. As we are not able to make "C" a constant, then "T" must always vary.

In vocational education we are training against at least minimum market demands which may be represented by "E." We must bring every individual up to this market demand if he is to secure employment. We can do this with each student in some length of time, but not with all students in the same time. The methods followed by the regular schools are exactly reversed. The regular school provides certain fixed periods in terms of years, length of course, or other time units. According to his varying capacity, every individual in a given course progresses

as far as he can. At the close of the period prescribed, students have all degrees of capacity instead of the fixed capacity required to meet market demands.

Evidently, then, promotion in the adolescent school must be based upon a series of performance standards, and cannot be based upon time units as in the case of the regular school. This again seems to offer administrative difficulties to the ordinary school man. Promotion on evidence of ability to meet uniform standards of performance is usually entirely beyond his experience as an administrator. Therefore it seems to him that it cannot possibly be done. It has been done and done every day without difficulty. It is the only method known or used in the industrial world. No other standard is ever employed in training on the real job. Many vocational schools have employed it successfully. There is no inherent reason why an instructor working with a flexible group should not set standards of accomplishment for different stages of his work, nor why each pupil should not be advanced from tool to tool, and process to process, step to step, only as he met these standards; nor why he should not be retained in the group until he did meet these required market demand; nor why the question of whether he should be retained or checked out or transferred to some other course should not be determined by what he is able to do.

There is no serious difficulty in administering such a system of promotion. It appeals to the ordinary boy and girl, to the parent and to the so-called practical man. They see some sense to it. As in the case of admission, the trouble is that up to the present time there has been little or no opportunity for school administrators to learn how to administer it.

Specific training—If the adolescent school recognizes and accepts the new habit psychology and the derived tenets of vocational education, it must organize its work as a series of specific training courses. Skill and job intelligence are not general habits but special habits of doing and of thinking resource-

fully about the doing which must be developed in the specific occupation in which they are to be used. The carpenter wants training in the use of skill and knowledge to meet the situation in his trade, the electrician in his, the sheet metal worker in his, the auto repair man in his, etc. Consequently, training courses for each of these lines should be as sharply distinct from each other as the conditions and processes of the occupations themselves.

A school giving instruction for five different trades or occupations should be organized into five distinct departments, each giving trade training only for its own specialty. This principle of organization has been more generally observed and worked out by vocational schools than any other, although it is by no means universal, or even given precedence as yet. All schools now separate for different training, in different shops, for different occupations. Too many still bunch pupils from different lines in a vain effort to teach them related functioning facts in the same class.

The great majority of *special* vocational schools, however, make no attempt to handle the pupils from different shops in common classes except for training in civics and other non-vocational subjects. Even this is not considered desirable, although it is sometimes done for the purpose of economy. This point needs but little more discussion, except so far as specific courses and classes have been affected by the theory of trade fundamentals.

Theory of trade fundamentals—There still exists in the minds of many people a belief that all occupations, or at least large groups of occupations, have common or fundamental processes and therefore make, so far as these processes go at least, common or fundamental requirements upon workers. Consequently, all these workers need the same training in these requirements and this training can and should be given to them in the same course and class. This idea seems to have developed from the fact that

certain groups of occupations either work in the same medium or are carried on under somewhat similar working conditions. Since the sheet metal worker, the blacksmith and the machinist all work with metal, there must be many common fundamental experiences in these four trades!

If this theory were true it would obviously be simple to give this training in fundamentals to prospective workers in all four of these trades. All the testimony of the modern psychology, all the studies that have been made up to the present time, and the experience of these trades indicate that there is no truth in the theory. In the light of present knowledge, it can safely be assumed that there is no such thing as occupational fundamentals.

Each occupation makes its own specific demands upon the worker. Each possesses its own specific body of content. Each is carried on under different working conditions. The mere fact that they happen to use the same material appears to have no bearing on this situation. If we discard the theory of trade fundamentals, it is necessary to organize the vocational school so that the learners are trained in distinctly segregated occupational groups so far as the vocational part of the program is concerned. In short, the manipulative experiences, the trade technical experiences, and the general vocational group subjects bearing on the electrician's trade should be taught only to those taking electricity, not to girls taking home economics or to boys fitting themselves to be printers or plumbers.

Working conditions—If the theory of training environment habits in the environment be accepted, each specific training course must in principle be, and in practice strive to become, as far as possible, a replica of the actual working conditions in the particular occupation for which the youth is being trained. As such a replica the training experience should provide not only equipment and processes, but environment and surroundings like those of the occupation. This is true whether commercial shops be used as in a cooperative school, or the school shops of a non-

cooperative school. The venture must be so organized that real tools, real equipment, real jobs are provided; occupational methods of handling work are followed; the actual processes are those of the occupation itself; and what may be called the "general atmosphere" is that of the occupation.

One of the most difficult problems of the school shop is to find for various occupations work of a practical kind suitable for training under the given conditions. The easy thing to do is to substitute exercises or pseudo jobs. This has been done to a regrettable extent because the administrators of many schools have found it the "easiest way." Owing to unavoidable situations, the resort to exercises or the pseudo job is, admittedly, necessary at times. It should never be regarded as desirable. Schools should be organized on the theory that such exercises and pseudo jobs are not to be used in training.

The statement is often made that work of a practical character cannot be done in school shops. Undoubtedly, it is very difficult to carry on work of a practical character in a real occupational environment where the methods and organization of the regular school are adopted. It has been successfully done only in those schools which have broken away from the standard regular school organization. These schools include many that are operated by public school systems. The difficulty here is not so much the impossibility of the task as the fact that only a very few people have as yet boldly attacked the problem and learned by experience how to meet it successfully.

Repetitive training—The objective of the vocational school is, as has been stated, to give doing ability up to at least minimum occupational demands. If it is to give this ability to meet occupational standards, the school must be so organized as to provide repetitive training sufficient to produce it. This offers no difficulty if students are handled in rotating groups instead of fixed classes; if individual instruction is given; and if each student is promoted only on his demonstrated ability to do the

thing and use the thing taught. Here the proof of the pudding is in the eating. Is the girl to be a stenographer? For what occupation or level of occupations is she to be trained? What must she be able to do in order to get and hold a position? What can she do now as a student? What must she be able to do as a student before she is ready to take a position? The question merely becomes one of can she do it, rather than how long has she been doing it?

It is not necessary that these repetitive experiences should always follow each other. If a boy needs to do the same job five times, it is not absolutely necessary that he should perform it five times in succession, one immediately after another. Ultimately, however, he must have done that particular kind of a job five, six, ten times or any other number of times necessary to give him the individual doing ability required by the occupation for which he is being trained and in which he must "make good."

Personnel management—This term is deliberately used here in the same sense as in commercial and industrial organizations. Essentially the true vocational school is an organization for getting things done, or, more strictly, for training people to get things done. The problems of personnel management in such a school are precisely the same as those of business, and the methods and devices used must be similar. In the regular school, large masses of pupils must be handled. This task, together with certain other considerations which need not be discussed here, has led to a form of discipline which is essentially that of police control. It is based on rules and regulations, punishments for their violations, and the general repression of the individual. It gives little or no opportunity for the development of self-directed activity leading to the formation of habits of conformity. The vocational school can not do this sort of thing, and need not do it.

In one school, as an illustration, there were just two rules with regard to discipline: first, attend to your own job; second, do not

keep anyone else from doing his job. These are fundamental laws of the economic world. Every case of disturbance or friction was handled under these two rules which were accepted as sound by the pupils themselves. Tact, sympathy, square dealing, and all the other factors found in successful personnel management must be used with the student as well as the employee side of the vocational school rather than repressive discipline. There is something vitally wrong with any vocational school whose instructors must police its hallways to keep order. No shop or office ever does it. You need not look very deep to see the real value of a vocational school which treats its students as embryo men instead of children.

Summary—This chapter has discussed the vocational schools dealing with adolescents. Little, if any, of the organization used by the regular high school can be successfully used in these schools. Totally different methods are required. In the past, two general procedures have been followed in setting up day vocational schools. The first has been to copy the regular high school, modifying its organization only as far as was necessary to permit of vocational education. This has virtually always been done when the new work is offered as a department of the regular high school. Strange to say, it is still the usual practice where separate vocational schools are established under public auspices. Many schools derived in this way are in existence.

The second method has been to begin with the organization of the occupations to be taught as they are carried on in the shop, office, home or farm, and consider how far it was necessary to modify this economic organization to fit training in a school. In the first case, what may be called the origin of the school is the standard high school; in the second, it is, as the case may be, the commercial employments. The first modifies the regular high school procedure in the attempt to fit school training to the needs of employments; the second modifies the procedures of business in the attempt to fit commercial training to the needs of learners.

QUESTIONS AND POINTS FOR DISCUSSION

1. In what ways should the characteristics of a factory be modified to secure good vocational training in a full time day school? Give reasons.
2. In what ways should the characteristics of a typical high school program be modified so as to secure good vocational training conditions in a full time day school? Give reasons.
3. Which is theoretically the better, the full time non-cooperative day trade school conducting its own shops on a productive basis, or a cooperative scheme on the week about basis.
4. Assuming the cycle of instruction is understood to mean one "round" that includes shop and non-shop instruction, what should be the proportions between the two, for the following trades: a. Bricklaying. b. Printing. c. Plumbing. d. Machinist. Give reasons.
5. Why has the full time day school failed to draw any large proportion of the 14 to 16 year group that lies outside of the high school group?
6. What are the objections to paying students in full time day schools? Are these objections defensible?
7. Work out a plan for a grading system in a trade school that would rate pupils on things that mean something to a trade and to an employed boy or girl.
8. What are the real difficulties in securing individual instruction in vocational schools? What are the imaginary difficulties?
9. Why cannot all related subject matter be taught in the shop as the job demands call for it? Why isn't this done more?
10. Make a comparative table showing the kind and grade of objectives in a typical high school program and in a vocational school program.
11. Compare the underlying psychology of a good trade training program with that of a typical high school program.
12. Compare the social functions of manual training and trade training. How would these affect such matters as selective admission, character of equipment, length of course, time allotment, qualifications of teachers?
13. Make a list of what you consider trade fundamentals.
14. Make a comparative table showing the advantages and disadvantages of training through: a. Exercises. b. Pseudo jobs. c. Production jobs.
15. If useful articles are produced does this mean training on production jobs? Why?

BIBLIOGRAPHY

(See also bibliography at the end of following chapter.)

Industrial Education. Albert H. Leake. Houghton, Mifflin Company, Boston.

This book contains several chapters discussing the school for adolescents as the situation existed in 1913. These discussions are extensions of a number of points discussed in the text.

Prevocational Education. Leavett and Brown. Houghton, Mifflin Company, Boston.

This book is of interest in connection with the text because it deals with that form of general education which is intended to lay a foundation for the subsequent pursuit of an occupation or of training for that occupation. This form of general education has often been confused with vocational education, as the term is used in the text. It will be of value to the reader as it will assist him clearly to understand the difference in objective between the two forms of education, both being desirable.

The Worker and the State. Arthur Dean. The Century Co., New York.

Contains several chapters dealing with the day school for adolescents in its relation to industry and economics.

Publications of the Federal Board for Vocational Education.
Year Book. 1923.

Contains considerable information as to the development of pre-employment schools, in all fields of vocational education included in the scope of Federal aid.

Apprentice Education. Jennie McMullin Turner, Ph.D. Federal Board Bulletin No. 87.

A very complete compendium of information as to the present status of apprenticeship training. Contains descriptions of a number of typical corporation schools, largely industrial.

Part Time Schools. H. B. Smith, Edith McClure Patterson. Bulletin No. 73.

A very complete assemblage of information with regard to part time schools in the United States and in certain foreign countries.

Trade and Industrial Education for Girls and Women. Anna L. Burdick. Bulletin No. 58.

Contains a section on the day school for girls.

Part Time Cooperative Courses. C. F. Klinefelter. Bulletin No. 78.

Describes types of schools and gives suggestive curricula.

Trade and Industrial Education. Organization and Administration. Bulletin No. 17, Revised.

Includes a section on types of schools for adolescents. Chiefly administrative.

CHAPTER XI

THE ADOLESCENT VOCATIONAL SCHOOL AND ITS OPERATION

The previous chapter discussed the day vocational school as a social organization for the occupational training of adolescents previous to their entrance upon employment. That chapter, however, dealt only with matters of organization and administration. It remains in this chapter to inquire as to what courses, what methods of teaching and what kind of teachers this day school should have in order to realize its special social objectives.

Administration and organization provide only what may be called the machinery which makes good training possible. The actual value of any training depends upon: 1. the character of the training experiences used (courses of instruction); 2. the way in which those experiences are given to the learner (methods of instruction); and 3. the ability of the teacher to control and utilize methods and courses in such a way as to secure from them their greatest training value (qualifications of teachers, or "teaching technique").

It is probably needless to discuss here what has been already repeatedly pointed out, that the standards and practices of the regular school are of little or no value as guides to the vocational school in these matters. The reasons for this have already been pointed out and will not be repeated here, except so far as they may be referred to by way of reference.

Courses of study—According to the new habit psychology, a course of study is nothing more than a series of experiences so organized as to "put over" a series of previously determined objectives. The course of study in Boy Scout work, for example,

is a series of participating experiences carefully organized for the purpose of securing from a youth certain desirable social habits and attitudes. The training value of the course does not lie in the subject matter itself, but in the effect which is produced upon the learner by equipping him to meet the requirements of the objective as set up. The training value of lessons in golf does not lie in what a Scotch instructor may say and do, but in the effect of the whole experience in directed play upon the future skill of his pupil. Likewise, the real value of the Boy Scout work is not the exceptionally shrewd and well planned experiences it provides, but in the total effect upon the young scout of his participation in them.

The reader must clearly understand that in the following discussion the term "subject matter" is not used in the sense in which it is usually employed by the regular school man. It does not mean informational content, but connotes the entire range of experiences through which the learner progresses in attaining a specific doing ability of a predetermined character. In the golf lesson this range of experiences would include, for example, all such things as what the instructor did and said to demonstrate correct play; all that he said to correct bad form or commend improvement in the play of his pupil; all that the pupil did under supervision as a player; and all that he did as subsequent repetitive practice to fix the things he had learned.

What corresponds to subject matter in most regular school courses is what in vocational education is commonly designated auxiliary or technical information, that is, the information which the worker must possess and must intelligently apply in the doing of any job. For greater clearness, the entire range of training experiences, including auxiliary information, manipulative training and repetitive experiences will be designated as the content or subject matter of a course. For the Boy Scouts, his reading of the Manual for Scouts and the things he learned from others about his projects in Scout work would be auxiliary infor-

mation. His efforts to do the things required would involve manipulative training. The doing of these things until he can do them right would be repetitive experience.

When a student in a sheet metal shop reads about solder, this is technical knowledge, or auxiliary information, as the case may be. When he learns to use a soldering iron under instruction, this is manipulative training. When by continual practice he gains more and more skill in doing soldering jobs, this is repetitive experience, or training. All of these experiences are a part of the "subject matter" or content of his training course.

Specific content—In the chapter on Working Theories, it was shown that all vocational training content must be specific and that its source for any occupation is always found in the experience of those who have already attained a mastery in that occupation. This means two things: First, this content, which exists only in the minds of competent workers, must be identified and in some way organized for purposes of training; second, this content when so identified will be found to have little or nothing in common with corresponding content in any other occupation. In setting up its program, therefore, the day vocational schools must provide as many specific courses or groups of courses as there are occupations for which it proposes to train. The only exceptions to this statement are certain general vocational courses described in a preceding chapter.

The identification of content—It is a somewhat strange fact that, until recently, the specific content of few, if any, occupations has been made a matter of record. It had never been set down on paper. While writing this, one of the authors is also engaged in assisting an instructor in molding, who is a competent man in that trade, to develop job instruction sheets and information sheets about molding jobs. These are to be used by him for the training on the shop floor of new workers in twenty-seven different shops. We have been unable to find anywhere in print as much as 10% of the content we must use in preparing

this instructional material! There have been a few books written *about* a few occupations. All of them give more or less valuable facts *about* these employments, but virtually none has ever given a complete and correct analysis of the content of the occupation or trade in terms of its jobs, operations, operating points, procedure, methods, skills, demands or functioning facts.

Within the last few years, however, the specific content of a few occupations has been identified, classified and set down on paper. The Federal Board for Vocational Education has given considerable attention to this matter and has worked out a procedure for dealing with it. In working out this procedure, a number of occupations have been analyzed for their specific content and the results have been published in several Federal Board bulletins. This method has been developed through the use of a system of classification worked out by one of the authors.

Corresponding methods of procedure have been developed to a considerable extent for commercial, agricultural and home economics occupations. Similar methods have been worked out and applied to certain occupations by the Research Departments of a number of universities, notably the University of California. The object of all this work has been to secure an effective procedure for determining the actual functioning content of a given occupation as a preliminary to setting up in some way a course of training in that occupation. The reader who is interested in following this matter further will find full information in the bibliography appended to this chapter.

Certain working conditions—The experience of those who have undertaken to work out the procedure just mentioned have indicated certain facts which are of fundamental importance and which may be expressed briefly in the following statements: In proportion as an individual has, through a long progressive experience, secured a thorough command of a given occupation, he is unable consciously to recall or state what those experiences are. This simply means that these experiences have become stored

almost beyond recall in his subconscious mind. When a competent worker carries out a job according to correct procedure, recalls the necessary auxiliary information, and draws upon his specific technical knowledge, he performs these operations unconsciously to a very great extent. As a result he finds it extremely difficult, if not impossible, even when paid for the effort, to tell what he does and how he does it and why he does it that way. Rarely can he tell it accurately, fully, logically and in needed detail. If this be true, then the more competent an individual is in his occupation, the less able he is to analyze and set up the specific content of that occupation.

There are abundant evidences of this on every hand. The most brilliant golf player is likely to be a very poor teacher of a beginner at the game, because all the difficulties he needs to sense and anticipate for the novice have been automatically mastered by the teacher so long that he has become entirely unconscious they ever existed. Most text books about trades and occupations are notoriously over the heads of the ordinary workman, who does not find in them what he wants and needs as help in his work. For a time it was thought that this was because the author had no actual experience in the trade. Closer examination shows, however, but little improvement in most texts written by competent technicians or workers who are also masters of skills and processes. This is not because they do not know content. It is because they know it too well. Its use has become unconscious and automatic, and for this reason they have forgotten their own learning difficulties, and therefore fail to realize the very real needs of ordinary workmen.

Many inefficient courses of training have been established as the result of following either one of two faulty assumptions. The first assumption may be stated substantially as follows: The competent worker does not know the content of his occupation nor how to develop courses of study from it. The only person who does know or can find out by study is an individual who at

most need have no more than a very casual contact with the occupation itself. A second faulty assumption has led to more, but at the same time not entirely, satisfactory results. This has been the belief that the thoroughly competent worker is capable, unaided, of developing complete courses of study based upon complete and correct analysis of the content of his occupation or trade.

Broadly speaking, we have had two situations: In the first, the theorist having no real experience in the occupation itself, but being intelligent and well educated, sets up a course which contains what he thinks the learner should know. In the second, a thoroughly competent worker in the occupation or trade is placed in charge of a group of learners, and he and his group are left to struggle through the training course as best they can. Neither plan has yielded satisfactory results. Acceptance of the first fallacy has resulted in some extremely weird and inefficient courses of training. Acceptance of the second fallacy has led to courses of training which, so far as they went, were good but which were incomplete and very badly organized. The recent work which has been conducted in this field has shown conclusively that the only effective way to secure a complete functioning content for a given occupation and to build out of this content courses of instruction meeting the real needs of learners at every stage of their progress is to make it a "two-man job."

A group of one or more competent workers must be brought together with some person who is able to assist them in recalling experiences which they habitually use in the practice of their occupation. He must also be able, after that information has once been secured, to organize it into suitable training courses. This is the only method which has so far secured fairly complete and definitely functioning teaching material for the vocational school. Since this method has been worked out and has been applied in practice, the functioning content of a number of occupations has been secured. This is notably true of the courses of

study in printing published by the United Typothetæ of America (Chicago); the training manual on tile laying for students and instructors issued by The Associated Tile Manufacturers (Beaver Falls, Pa.); the Federal Board Bulletins on Bricklaying and other occupations; and the job sheets and information sheets on the plumbing trade published by the Research Bureau of the National Association of Plumbers and Steamfitters, and prepared in cooperation with Dunwoody Institute.

Organization of courses—The preceding paragraph drew attention to the difficulties which have prevented the organizing and setting up of the complete and specific content of occupations and of occupational training. Such content, when determined, forms merely what may be called the “raw stock” for courses of instruction. Once determined, there still remains the question as to how it can be effectively organized into actual working courses to meet the needs of various groups and under various working conditions. These courses must make provision in some way for training in processes and operations (manipulative training), in repetitive experiences (practice), in the intelligent application of facts to guide skill (trade knowledge), and in auxiliary information.

Typical organizations—In the organization of the day vocational school, there have been developed three typical types of courses which may be designated as the long course, the short unit course and the project.

The long course. In its organization the long course, so called, is obviously an imitation of corresponding courses carried on in the regular high school. The entire content of this course is organized into one continuous series of training experiences. Such courses may be organized to run from six months to four years, according to the amount of content of the occupation for which the training is given. Thus, for example, we may have a course in trade mathematics or science or drawing which is given for so many periods a week for one or two years. The same thing

might be true of a shop course in the machine shop, in stenography, or in small animal husbandry or in cooking and sewing.

Here is a typical illustration of the long course as taken from the annual catalogue of one public evening school: "The evening class in cooking is open to all women over 16 years of age. It opens in October and closes the first of May. The class meets Monday and Thursday nights from 7:30 to 9:30. One hundred hours of instruction will be given to cooking problems." Here is a typical illustration of the long course in the day school found in a circular of announcements issued by a privately endowed institution: "The machine shop course is two years long. During the twenty months of training, instruction will be given in shop subjects for about half the time, and the remainder of the day will be devoted to such technical subjects as mathematics, science, drawing, and to training in citizenship. Application to shop problems will be made of the instruction in these technical subjects."

The short unit course. In distinction to the long course just described, the short unit course breaks this content up into small blocks or units. In machine shop work there may be one unit in bench work, a second on the drill press, another on the engine lathe, another on the milling machine and still others on processes with other tools and machines. For sheep raising, unit courses might deal with breeding, feeding, diseases, housing and protection. In garment making, one unit might deal with kimonos, one with underwear, and another with house dresses. Where the short unit is used in the evening school, its maximum length is rarely more than sixty hours and in many cases has been as short as eight hours.

Where the unit plan is used in the day school, it is customary to arrange the units in a progressive order. As an illustration: In one school the entire training course for each occupation is divided up into a series of sixty-day units. A boy who enters the school takes the first unit. If he remains, he takes the sec-

ond and third in order. On the other hand, he may drop out of school for a period to earn some money; return to school and take another unit; and again drop out only to return again for another unit or units. According to his means, he may ultimately work through the entire training course, taking as much time as he needs. One boy may stay in school continuously and finish in two years. Another may require five to six years as he alternates between the school and some employment through which he gets sufficient funds to complete the requirements.

It is understood that the unit method can be applied equally well to shop work, trade knowledge and auxiliary information. In the same way there can be set up units of training, in all such subjects as materials of a trade, safety precautions, occupational diseases, and history of the trade. It is evident that the substitution of short units for the long term course gives much more elasticity and fluidity of organization and administration, and hence lends itself much better to the sound working theories for vocational education set up in a preceding chapter.

The project. In the following diagram A might be the course in trade mathematics, B in trade drawing, C in safety precautions, and D in shop work.

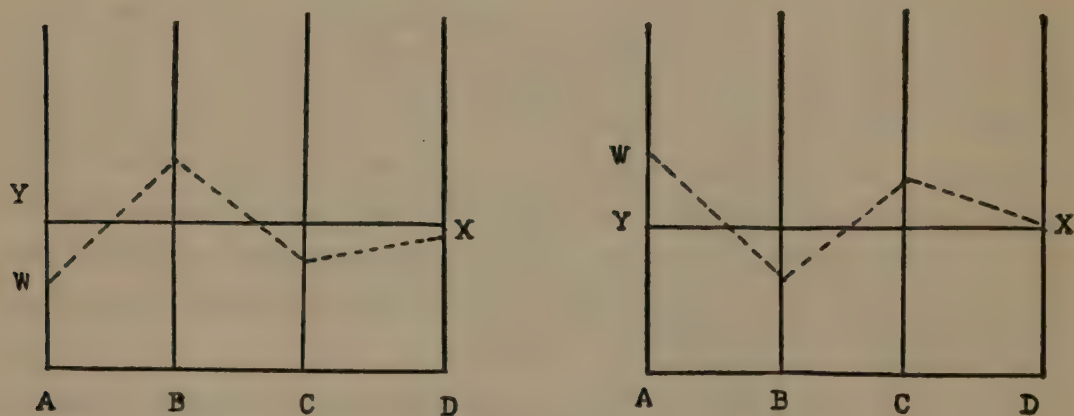


CHART No. 2

Showing Problem of Correlating Subjects

Under this arrangement a different teacher could be assigned to each course. The more common plan is to assign all courses

dealing with auxiliary information (such as safety precautions) and technical knowledge (trade mathematics and trade drawing) to one instructor or to a number of instructors, but all shop work to an entirely different one.

There is, of course, no reason why one instructor could not handle all these courses. This is the more efficient although less common arrangement. It is uncommon because most vocational schools have borrowed from the regular high school the departmental organization of all subjects into separate courses under separate teachers. The department plan in the general school is built upon the theory that each subject is distinct from every other subject and requires a specialist to teach it who is especially well qualified to handle it. Since these subjects are taught as mental discipline and not for use, they need not be related to other subjects or applied to any practical way. Consequently, no correlation between different subjects is possible or necessary and instructors do not need to know anything about the application of what they teach to the practical social or civic problems, or the occupational needs, of workers.

All this is contrary to all the objectives and working theories of the very vocational schools which have adopted and insist upon clinging to the departmental plan of instruction. All effective vocational training requires training in both theory and practice—in doing and thinking about the doing. Practice in doing anything is needed to explain and fix theory, while theory is necessary to guide and improve skill. Both are necessary to real job intelligence. The more intimately and closely theory (knowledge) and practice (skill) can be related, the more effective will be the training in each, and the more resourceful will be the job intelligence developed in the student and worker.

If you want to become a good golf player, you must practice golf while you think golf, talk golf, read about golf and take lessons in the theory and practice of golf. Similarly, if you want to train a farm boy to be a successful dairyman, you must have

him take care of cows as they should be handled, *while at the same time* you teach him the functioning facts he needs to know and use in his work. In the vocational school all courses should have a close tie up with each other, and every subject should be taught for the purpose of improving the practice of the occupation. Furthermore, the content of the courses in vocational schools of secondary grade is elementary and does not require a highly trained specialist or technician to handle it. What it does require to relate its subject matter to the work of the occupation is a teacher who knows how to use it on the job.

Evidently the departmental plan of separate parallel subjects and special teachers for each subject secures little, if any, correlation or tie up between shop work and related studies. Suppose a boy, for example, has reached a certain point in his shop work (d) indicated by X on both the preceding diagrams. It is extremely improbable, if not impossible, that he will have simultaneously reached in his other subjects or courses the corresponding trade knowledge (A and B) or auxiliary information (C) which the job (X) requires, and which the worker on job X needs to know and fix by use. If this correlation existed, we would be able to draw a perfectly straight line (XY) across the diagram. As a matter of fact, the real situation is always represented by the uncertain and shifting dotted line WX. Wherever the line WX falls below the line XY, the shop work calls for related knowledge which the special class for it has not yet reached and the missing related knowledge will, when it is finally taught, call for application in the shop on jobs already completed and passed in the course. Wherever the line WX rises above the line XY, the related knowledge, if it is related, applies to shop problems and situations with which the student has not yet had any experience as the basis of understanding of the class work. He does not understand its application clearly, and he cannot therefore fix it by using it while it is fresh and vivid in his mind. When this job is reached in the shop, the class has completed the work

on the related knowledge and passed to something else. These two situations would be illustrated by the case of a boy who was in one case given a job of cutting gears before he had been taught the mathematics of gear cutting, and by the opposite case of a boy who was taught how to do the figuring for gear cutting without any previous or current shop experiences in such work.

If we take the Job X as our letter or mark of progress in the pursuit of all the other courses, the student is always either "behind the game or ahead of it." This continually introduces into his training cold storage information, because of the lack of an apperceptive basis for understanding the use of technical knowledge in his shop work and the lack of opportunity for fixing knowledge through its use. It also introduces as a further factor of inefficiency rule of thumb work in the shop where lack of knowledge prevents intelligent and resourceful thinking about the problems of the job.

The difficulties encountered in the attempt to secure effective correlation, where parallel independent courses are operated, have, of course, long been recognized by educators and need no comment here. The organization of all shop and class work into short unit courses furnishes a partial, but not full, solution of the problem. Suppose, for example, the shop work in the electrical course were broken up into a series of consecutive units of experiences in signal work, house wiring, electrical batteries, and instruments, D. C. current, A. C. current and storage batteries, each taught for a definite specific period. It becomes more possible to provide the mathematics, science and blue print instruction in these shop subjects during the period they are pertinent to the work in the shop. This would solve the difficulty were it not for a number of other important facts.

The content of the mathematics bearing on signal work, for example, may not be such as to require exactly the same number of weeks to teach it as does the shop instruction. While this unit course scheme would insure the teaching of the related subjects

pertinent to electrical signaling simultaneously with the shop work, it would not insure that the student would get, day by day and week by week, the related knowledge bearing on each job at the time he needed it most, which would be at the time he was performing it. This could only be done if every pupil worked every day on the same job as every other pupil—a condition contrary to the facts. Pupils must work simultaneously in school shops at least on different jobs in order to gain full use of varied equipment, and for different individuals the time required for job mastery will also vary. No school could afford to provide the full equipment for all shop work at the same time for the same task. These same difficulties would be encountered in the case of all the other unit courses just as much as in signal wiring. Evidently the organization of subject matter by short units of instruction is a step in the right direction but it needs to be supplemented by some other device to insure really effective correlation of shop and related knowledge.

That device is what is known as the “project” or project method of organizing subject matter for teaching. According to this method, some one subject is selected as the basic or dominant one. The parts of other subjects which apply at each step in the dominant course are given at that point. This situation could be pictured by the following diagram: in which D indicates any special point in the dominant course. The arrows surrounding it represent the fragments or selected parts of related subject matter drawn from all other subjects which bear upon or apply to D.

In vocational education, the basic or dominant course should be the shop training so that D in the diagram becomes a given shop job. The arrows represent the special information from specific occupational mathematics, science, drawing and safety precautions, etc., which are needed for use in that particular job. If the learner in the shop already has this information and can use it, he requires no further help in getting or applying it. He

requires only supervision to see that he uses it accurately as a tool in the proper and rapid performance of his work. If he does not have it, then he requires help in securing and using it. This would be true of the special information required for each job as the learner progressed from one task to another. All his experiences, connected with a given job and with the getting and using of the facts that will help him to do that job properly, constitute as a whole a project, and the plan of teaching through projects constitute the project method.

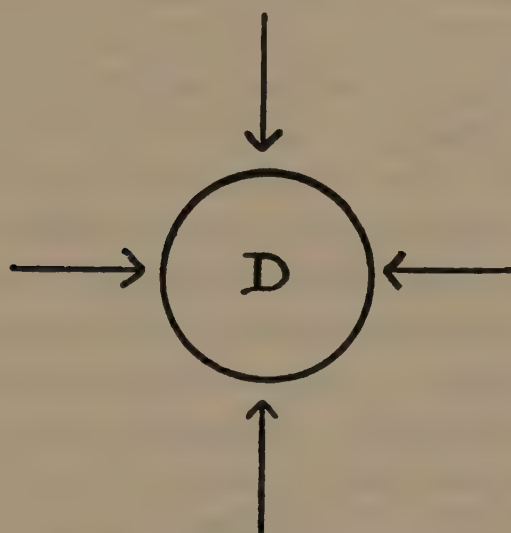


CHART No. 3

Showing Correlation Through the Project Method

Perhaps as simple an illustration of the project method as can be given is furnished by the Boy Scouts. In meeting the various requirements as he progresses from one stage of advancement to another in the organization the Scout performs a series of assignments such as building a fire in the woods, pitching a tent, rowing a canoe, learning to swim, following a trail and the like. Some way he must learn to do each of these things according to the standards and traditions of the Scouts. This learning and doing of a job is a project, but the core or heart of the project is the building of the fire or the following of the trail, and on it are focused for the time all the facts he can learn from any source

that will help him do it well. In this way it becomes the *core of instruction*.

Similarly, a boy in a secondary agricultural school who is taking the short unit course in poultry keeping is assigned a series of tasks in the proper care of chickens on the home farm. These activities or jobs include all such things as getting a select stand of birds, selecting the site for the chicken house, building the chicken house, proper feeding, safeguarding against certain diseases, gathering and marketing eggs and the keeping of simple accounts. In connection with each task as he progresses with his work, he is taught how to do, and why to do, it in the approved way. While this unit course on poultry keeping is being carried on by the agricultural instructor, each of these activities becomes in turn the core of instruction and all related matter pertinent to it is built around it for use. When the first project is under way, for example, that of getting a select stand of birds, the class instruction would develop in a very direct way all such things as the reasons for care in selecting strains, the different strains and their comparative value for different purposes; the strain to select for the best economic results in the locality; and the best policy to follow in securing a flock, which may be by the purchase of selected breeders, the purchase of selected eggs or the combining of strains already on the home farm.

In like manner, the industrial school would have a series of unit courses in the electrical department, one of which, for example, might be house wiring. While pursuing this course, the student is assigned, let us say, the job of wiring a room. While on this work, he would have to use all such information as the size of wire required to carry the necessary current; number of outlets and size of lighting units to give proper illumination; proper location of switches; type of wiring for either knob and tube or conduit work; code requirements regulating installation; and proper ways to patch around holes in plaster or wood work. He would be equipped to work out his problem, under the supervision

of the shop instructor, with all such things as the specifications for the job and the hand book of information for the trade. From these he would secure the necessary material and plan his procedure for installing it. When his work has been inspected and approved, he would figure the cost of material and labor as it would be done on a commercial job in the trade. Theory he must have, properly to understand his work. This should take the form of practical electrical information about all such things as current and the way it is assumed to run, the relation of voltage and resistance to amperage, the effect of size and length of wire on line drop, and the fusing points of different conductors. This he may get in other classes. If not, he should have what is lacking when he needs it for this wiring of a room.

Such a close correlation can only be secured by the use of the project method. Obviously the method can be completely or perfectly used only when the controlled experiences of students are broken up into short unit courses, each made up of selected projects and taught by the same instructor, rather than by different instructors, each responsible for some subject bearing on the project in hand. Such an instructor becomes a master of apprentices rather than a teacher of some special subject. He teaches theory when needed for understanding and for use. He gives pusher rather than cold storage education by assisting pupils over difficulties. His shop or class room, call it what you will, is a busy combination of workshop, work table, blackboard and demonstration place. At his best, he is explainer and demonstrator, theorist and master workman, friend and counselor, supervisor and inspector, foreman and teacher! There is nothing, moreover, to prevent any school from supplementing such a plan of true apprenticeship training with stated class room instruction by other teachers in the more general technical content of mathematics, science, drawing or art.

There is nothing startling or revolutionary in this project method of teaching. Indeed, it is the natural way by which

people have been taught for centuries outside the schools. It is the method commonly followed today in the occupations themselves. When a good foreman must instruct a green man in the performance of a certain job, he gives him not only training in the manipulative work of the job, but also such shop knowledge and auxiliary information as is required. This foreman is actually organizing instruction on a project basis, but of course he does not know it. As has already been stated, the Boy Scouts use the project or "stunt" as the basis of all their training, while the development of projects on the home farm for students of secondary agriculture has met with such marked success that it constitutes today the chief pedagogical contribution in that field.

Admittedly, this method of organizing and giving instruction is not so easy from the teacher's standpoint as to copy traditional courses, teach subject matter in water tight compartments, isolate the shop from the class room, keep pupils busy on formal shop exercises, buy text books whose content is only remotely connected with the work in hand, and pour out a multitude of non-functioning facts by the lecture method. The right way to teach an occupation is difficult only because we are not accustomed in our school economy to the employment of teachers who are occupationally competent in both the technique and the technical knowledge of the business; to the organization of our instruction with the student as the unit of training; to the use of much individual instruction instead of all class instruction; to the teaching of knowledge for training in sound thinking habits through the use of facts for doing; in short, to doing ability instead of knowing ability as the measure of education and of power.

Methods of instruction—If the preceding discussions in this book have served their purpose, the reader is already convinced of the fact that methods of instruction based upon the old faculty psychology and the doctrine of formal discipline cannot find an effective place in the work of vocational education. This means that the vocational school has had to build up a different system

of pedagogy by selecting methods and devices particularly suitable to its work. Of all the methods and devices developed for effective teaching, many employed by vocational education are also employed by regular schools. On the other hand, a number used in the regular schools have been found of little or no value in vocational training. This is particularly true of the lecture, the memoriter lesson, the assigned home lesson and memoriter examinations and tests. On the other hand, demonstration, to a less degree illustration, and the performance test have been found to be of the greatest service. Since these matters are fully discussed in other publications they are not stressed here.

Working devices—The reader must not forget that, since the purpose of vocational education is to create doing ability, it must see to it that the learner secures adequate training of a specific character in manipulative skill, in resourceful thinking and in the ability to secure and select functioning information. These results must be secured, not under uniform, but under varying conditions. These conditions vary widely according to the specific character of the occupations for which the training is being given and to the characteristics of the group to be trained. To meet all these situations, there are three distinct kinds of educational procedure which have to be followed: the imparting of information, instruction, and organization of past experiences.

Imparting of information. There are two ways by which an individual can secure information. One is to get it from some one else, and the other is to get it himself. First hand information can only be secured by participating experiences such as is gained by a child about a hot stove, by touching it. But the amount and range of one's personal experiences are admittedly very limited. Consequently, it is necessary to secure second hand experiences through information as it exists in the minds of others. This second hand experience or information may be secured by word of mouth, or through the use of written or printed material. The essential thing in modern life is not that an individual should

be a walking encyclopedia, but that he should be able to secure information as he needs it and that he should know what information he needs. The problem of the vocational school is, therefore, not to "pump" the learner full of facts but to train him in methods and habits of securing information as he needs it. Of course, any facts and ideas he may secure and habitually use will be retained as long as he has use for them. When that use has ceased, the natural tendency of the mind is to forget this information and substitute that which is of value under the new working conditions and for solving new and different problems.

In dealing with this matter in practice, the vocational school must abandon the traditional method of presenting much information through the teacher, with the expectation that the pupils will retain it, and must use some plan for forcing the pupil to search out and select functioning information as the need for its use arises. Only in this way can he be trained in a procedure for getting and selecting usable facts. Only by the repetition of this procedure for many different situations and facts can it become a habit of mental work for use in life. Some one has aptly said that after all this is only training the youth in the spirit and some of the elementary procedures of the research method.

In order that this may be done successfully, the specific content of occupations must be secured by the methods already described. It must be set down separately for each occupation so that it is available to the learner in accessible and intelligent form. This means that every class training in any given occupation should be equipped with all the specific usable information about that occupation. This does not mean to put the customary text in the hands of the pupils alone. It requires job sheets, information sheets, pamphlets, hand books, trade journals, catalogues, charts and all other sources of help in intelligible and usable form.

To the degree to which this can be done and the learner can be trained to use such hand books and reference books intelli-

gently, the time of the instructor is saved for more important work. To the extent that directions which the learner can follow or information which he can secure through intelligent reading can be placed in his hands at the time that he needs them, this sort of material becomes a time saver and therefore an efficiency device. Job sheets, technical information sheets and hand books are tremendous labor saving devices for the instructor, although they do not, of course, relieve him of the responsibility of instructing. He needs to direct the self-activities of vocational students more and talk less. He needs to give help more when needed and less when not needed.

Instruction. As distinguished from the imparting of information, instruction as here used consists in directing the thinking of an individual and in subjecting him to controlled experiences under direction. It is efficient in vocational education at least, to the degree to which he acquires actual doing ability with regard to the stated objective of the instruction, whatever that may be. All the teaching devices described in preceding paragraphs are desirable, but do not relieve the instructor of the actual instructing work. Where instruction is called for, the vocational school has very generally used the standard Herbartian lesson, usually using only the first four steps in teaching, i.e., preparation, presentation, application and testing. Most shop jobs in all vocational schools follow in some form this procedure. Some *preparation* at least is given the pupil by telling him what the article or product that he must make is to be and for what it is to be used. Some directions are given by the teacher or by the lesson sheet, which *present* the materials, tools and operations to be performed and the cautions to be observed. The pupil then makes an *application* of all this by performing the job. *Testing* follows when the teacher imparts and approves the product he has made. This practice of the shop has also greatly influenced class room methods and led to the wide use of the Herbartian steps in instruction.

In the use of the Herbartian lessons, however, the vocational

school has done certain things which are not always done in the regular school. This is particularly true with regard to the application step and the testing step. In the Herbartian lesson as used in the regular schools, the application step is seldom fully carried out with all students and the testing step is often omitted entirely. This is because the regular schools have no way to get actual experience for their pupils in applying what they are taught, and therefore no way for testing their use of the knowledge imparted. As has already been pointed out, this constitutes a grave weakness in most of our school efforts to give social and civic training. Vocational schools, on the contrary, do have an opportunity to have all knowledge applied in a practical way in shops, offices, homes and farms and to test the results of their teaching in very concrete and practical ways. As a result, vocational schools are giving more and more attention to lesson planning and to the four steps in the lesson. They are also making progress in the study of conditions under which the formal lesson is a suitable and proper device to use. In general this condition exists wherever what is to be taught is entirely new to the learner.

Organization of past experiences. The conference as a device in vocational education is of comparative recent origin. It is not an instructing device in the sense that it proposes in any way to add to the knowledge or experiences of individuals. It is true, however, that by the pooling of the experiences and ideas of each member of the conference group, many things are learned. Its purpose is to assist them in organizing this knowledge and these experiences in such a way that they may be used more effectively.

Up to the present time, the conference has been utilized almost exclusively with mature, competent workers such as foremen or teachers or farmers. In essence, a conference consists of a leader and a conferring group. The leader proposes a vital topic for discussion. With foremen, this might be, for example, the selection of workmen or the training of new employees. As confer-

ence manager, not a partisan or debater, he leads the conference members to develop all the main factors and problems in the question under consideration, to apply their experiences to them, and to draw conclusions concerning their responsibilities as foremen and the best ways to discharge them.

Recent experience, however, has indicated that the conference can also find an important place in the work of the vocational school for adolescents. The conference, of course, will only work where the members of the group have experiences in sufficient amount to form a large basis for the organization and discussion of facts and ideas. It has been found, particularly in the continuation schools, that employed young people have a far greater mass of experiences than the regular school has assumed. The possibility of drawing on these experiences for conference work has been demonstrated to be considerable. Employed boys and girls learn through their general contacts with workers in occupations. Any boy who has been brought up on a farm knows much about farming. Any girl who works in a factory knows considerable about factories. Every employed youth has had very wide experiences with the economic problems of an independent wage earner. All young people have had all sorts of experiences in the social field, which can be drawn on for civic education. The conference is simply a device for utilizing all these experiences as thinking stuff for the training of adolescents. As such it is discussed in a subsequent chapter on The Continuation School to which the reader is referred.

As the work of the vocational school has developed, it has become more and more clear that instructors and administrators must be able very clearly to distinguish between the three fields of instruction described above as imparting information, instructing and the conference. Each has its own methods. There are for each certain conditions under which it can be employed successfully. Like any other set of tools, each is only of use where the demands of the job best fit the use of that particular tool.

The individual who must use these particular tools intelligently is, of course, the instructor.

Qualifications of teachers—A number of years ago it was assumed that the competent worker was only capable of teaching the purely manipulative forms of his occupation. Instruction in related subjects, trade technique and auxiliary information must be given by an instructor who had received a totally different sort of education. This led to a sharp distinction between the shop instructor and the technical instructor which unquestionably hampered the efficient development of the day vocational school.

This policy has been due primarily to the fact that high school teachers are college trained. Such teachers do not know the manipulative experiences of a trade or occupation and cannot be expected to know it. Consequently, that part of the training must be given by an instructor with adequate occupational experiences. The rest of the instruction, however, must be given by a teacher of the same general type that would be employed in the high school. This conception has conclusively been shown to be fallacious. As the day school has developed and has learned how to do its work better, the tendency has been to do away with the so-called technical teacher and to employ as instructors for all subjects in the vocational program only those who are occupationally competent.

The qualifications of a desirable instructor in a vocational school are now fairly well defined and may be stated as follows: ¹ He must know his occupation as the result of a considerable amount of actual participating experiences—he must have come up “through the mill.” He must know how to teach. He must have the personality and the sympathy which would enable him to deal with adolescents. He must be familiar with the principles, social functions and characteristics of vocational education. In addition, it is usually considered desirable that he should have

¹ For full discussion, see Federal Board Bulletins No. 62 and 90, and State Bulletins.

some knowledge of the legislation which affects his job, as well as some knowledge of other forms of education of a semi-practical character such as pre-vocational training, industrial arts work and manual training. He needs this so that he will not confuse his own job with that of other instructors carrying on work equally desirable, but having an entirely different social and educational end.

Teacher training—The regular school system has for a long time included normal schools and colleges whose function is to train teachers for work in the general schools. If the preceding discussion of the conditions that exist in vocational training be sound, it is evident that the courses conducted in these institutions for prospective teachers of regular subjects can contribute little or nothing to the training of teachers in vocational subjects of secondary grade. This situation has been recognized by the setting up of special training courses for vocational instructors. In most states this teacher training work encouraged by State and Federal subsidy has been delegated to the State University or to one or more State Normal schools. This has been done with the expectation that these institutions can equip the occupationally competent individual with the other assets he must possess as a vocational instructor. In some few cases, notably in Massachusetts, this special teacher training has been directly carried on through the State Board for Vocational Education. The teacher training activities carried on by the State institutions have not resulted in the development of a very satisfactory vocational instructor. For the occupationally competent workman, at least, the best teacher training work has been done under the direct control of the State Board for Vocational Education.

This difficulty in securing the satisfactory preparation of vocational teachers has been due to a number of causes: So far as the State institution is concerned, it has always been organized and operated on the theory that training should be given on the campus. Individuals desiring teacher training should come to

the institution, regardless of where it is located. There they can secure the prescribed training on an extensive scale in from two to four years. During this period they should be able in some way to secure means of support other than by working for a living. This has worked very well as long as these State institutions were training teachers for the general schools. They have been able to secure an adequate number of young people desirous of becoming teachers, who are either supported by someone else during their training, or who are able in some way to support themselves by earning sufficient money to keep body and soul together.

If we hold to the requirement that a vocational teacher should be occupationally competent, we run against several factors which seriously interfere with, if they do not entirely prevent, the success of teacher training courses of this type: The competent worker has had to undergo a period of experience in securing a mastery of his occupation which makes him more mature than the ordinary student of the normal school or college. He is well into the income earning class. Rarely, however, has he reached the point where he has any amount of surplus wealth that he can or will use to maintain himself for a long period of training on the campus of any institution, or anywhere else for that matter. In short, he cannot afford to quit his income producing job for two or three years to secure training.

As a result, those institutions which are receiving State and Federal funds for the training of vocational teachers have been forced to do one of two things: Some have continued to conduct long term courses and receive as resident students, people who are not occupationally competent. Some have extended their courses outside the walls of the institution in such a way that a workman or a novice teacher can take training simultaneously with the pursuit of a gainful occupation. It is evident that where any institution sticks to the long term residential course, it is impossible to produce qualified instructors, qualified at least accord-

ing to the standards and tenets in vocational education set forth in this book. Those occupationally competent are seldom reached on the campus and utterly neglected at home!

Nevertheless, a large sum of money coming from both State and Federal sources has been expended in the attempt to do this. It is doubtful if, in any case, a thoroughly competent vocational instructor has as a result been brought into the work of the vocational schools. In one State, at least, an attempt has been made to meet this situation by subsidizing competent workers for a two years' teaching training course. This, of course, does away with the economic difficulties discussed above, but entails a greater per capita cost for the preparation of a teacher than most states are likely to be willing to incur for this special purpose.

The most successful teacher training for vocational teachers in the day schools has unquestionably been secured by the extension method and the use of the itinerant teacher trainer. Traveling from one community center to another he gives training after working hours to prospective teachers already occupationally competent and to those already employed as novices in the teaching service of vocational schools. This plan has been very thoroughly worked out in Massachusetts and has been followed in a number of other states. It is distinctly characteristic of those teacher training courses which have been developed under the direct control of state boards for vocational education.

The teacher, the predominant factor—The man who defined a school as a teacher on one end of a log and a student on the other, stated a profound truth. We may provide buildings, we may secure equipment, we may select our groups, we may define specific content, we may organize that content in the most effective way, we may surround the whole process of teaching with every facility and convenience. When all this has been done, we have in the last analysis only provided the tools with which the teacher works. In the vocational school at least, he is the key and pivot man. It is to be regretted that, up to the present time,

the development of effective training courses for vocational instructors has lagged far behind the development of those material things which facilitate efficient teaching but which cannot replace the efficient teacher. Probably the teacher training programs as generally carried on in this country are the weakest link in our whole scheme of vocational training.

QUESTIONS AND POINTS FOR DISCUSSION

1. Assuming that a vocational school is to meet the needs of the adolescent group in a community whose population is fairly divided between agricultural and industrial pursuits, would you recommend an independent vocational school or a department in the local high school? List out the advantages and disadvantages of both types of organization.
2. If the community was entirely dependent on two large industries, would this affect your recommendation? If so, how?
3. Define administration: what is the difference between an administrator and an executive?
4. When a child falls downstairs for the first time, is he getting a course of study? How?
5. In the sense in which the term is used in the text, what would be the content of the following:
 - a. Learning to drive a cut nail into hard wood.
 - b. Learning how to wash dishes.
 - c. Learning how to operate a typewriter.
 - d. Learning how to erect a perpendicular to a straight line by the method of intersecting arcs of equal radius.
 - e. Learning how to get from one point in a new locality to another point in the same town.
 - f. Learning how to place a postage stamp on a letter according to standard practice.
 - g. Learning how to sharpen a chisel.
 - h. Learning how to harness a horse.
 - i. Learning how to set up the service brake on a Ford.
 - j. Learning how to sew a French seam.
 - k. Learning how to reef the sail of a cat boat.
 - l. Learning several other jobs with which you are familiar.

In each case, list out all the experiences that must be secured somehow in order that mastery of the job may result. If unfamiliar with

any of the jobs listed above, substitute others with which you are familiar.

6. What do you understand is meant by an objective? How does an objective differ from the aim of a lesson?
7. Is a topical outline of subject matter the same as a list of objectives? Why?
8. Just what do you understand is meant by auxiliary material as distinguished from technical information? Are either experiences in the sense that this word is used in the text? Why?
9. Make analyses covering operations and operating points of the jobs listed in 5, or of other jobs with which you are familiar.
10. Must a person be able to do a job up to occupational standards before he can analyze it? Why?
11. Try to make an analysis of several jobs that you have performed so many times that you do them with your subconscious mind, such as: (Do not perform the job, but work from memory.)
 - a. Tying a four in hand tie.
 - b. Unlocking the front door with your latch key.
 - c. Lighting a match (including taking match from match box).
 - d. Walking.
 - e. Brushing your teeth.
 - f. Opening a door.
 - g. Any others that may occur to you.

In each case, note the character of the difficulty that you find in recalling each of the operations.

12. On the basis of your experiences in answering the preceding questions, can you suggest why an apprentice trained in a casual way by a good foreman is more likely to be well trained than when trained in many vocational schools? Would you dispute the above statement? If so, give your reasons.
13. A day vocational school for adolescents is to offer a four years' course. Should this course be organized on the basis of successive short units of not over four weeks each, or on the basis of long courses of at least six months each? Why?
14. List out the relative advantages and disadvantages of:
 - a. The long course where each subject is taught as an independent subject.
 - b. Each subject is taught by short units as an independent subject.
 - c. All material is taught by projects.

Make your list of these advantages and disadvantages for each of the three plans from each of these five standpoints:

1. From the standpoint of ease of administration.
 2. From the standpoint of effective correlation.
 3. From the standpoint of organization.
 4. From the standpoint of efficient instruction.
 5. From the standpoint of qualifications required of the instructor.
15. If a course were laid out by projects would each project have a distinct objective? Why?
 16. What is the distinction between the use of the term project, as denoting a correlation device, and the sense in which the term is used in vocational agriculture and home making vocational education?
 17. Work out the content of a series of projects whose "cores" are jobs with which you are familiar. Cover at least the following: (Use only actually functioning material.)
 - a. The related mathematics.
 - b. The related science.
 - c. The related drawing.
 - d. The related auxiliary information.
 - e. The related general vocational material.
 18. In the sense in which the word is used in the text, what is teaching? What is a teacher? Why are such "teachers" scarce?
 19. Would you accept or reject the following statement: "Nobody can teach anybody else anything." Give reasons for your position.
 20. Formulate a definition of instruction that will agree with the statements in the text.
 21. Why is the fourth step so often omitted in the general school, especially in such subjects as history or civics when these are taught with appreciation objectives?
Why is this step often very inefficiently carried out in such subjects as geometry and algebra, so far as some members of the class are concerned at least?
 22. Make a list of the requirements for a vocational teacher in any fields with which you are familiar or in which you can secure the "job specifications" from published material available.
With this list check the teacher training course as offered in any teacher training institution whose published course you can secure. How near does the preparation seem to equip the teacher for the job that he must face when he begins to teach?

BIBLIOGRAPHY

Home Economics Education. Federal Board for Vocational Education. Bulletin No. 28. Revised edition. Josephine Berry and Anna H. Richardson.

This bulletin contains general information as to the organization and operation of home economics education when conducted in accordance with the provisions of the National Vocational Education Act. It gives suggestive sequences of content, suggested courses of study and covers day, evening and part time schools.

Instructor Training. Federal Board for Vocational Education. Bulletin No. 62.

Describes and discusses the problems of teacher training in trade and industrial work, where the teachers to be trained are drawn from industrial occupations. The general principles set forth have been successfully applied in the training of occupationally competent people for other fields of vocational education, such as vocational agriculture and home economics. Manuscript prepared by Charles R. Allen.

Trade and Industrial Education. Federal Board for Vocational Education. Bulletin No. 17. Revised edition.

This bulletin deals with the organization and operation of vocational education in the field of trade and industry when conducted under the provisions of the National Vocational Education Act.

Agricultural Teacher Training. Federal Board for Vocational Education. Bulletin No. 90.

Deals with a tentative scheme for the training of high school teachers of agriculture.

Agricultural Evening Schools. Federal Board for Vocational Education. Bulletin No. 89. J. A. Linke.

This bulletin deals with the organization and operation of agricultural evening schools as conducted under the provisions of the National Vocational Education Act.

Evening and Part Time Schools in the textile industry of the Southern States. Federal Board for Vocational Education. Bulletin No. 30. Prepared by Roy Dimmitt in cooperation

with several committees of practical textile men. Illustrates a method of securing specific functioning content. Also shows how courses of instruction are developed through the utilization of groups of people having practical experience and a specific knowledge of local conditions.

The Massachusetts home project plan of vocational agricultural education. Rufus W. Stimpson. Washington, Government printing office. U. S. Bureau of Education. Bulletin No. 8.

A description of the home project device for securing the nontechnical experiences in agricultural vocational education as developed in Massachusetts.

Testing, Promoting and Grading Students. Rita Johnson. V. E. M. Vol. I, No. 2.

A discussion of the question of grading and marking students in vocational schools. Interesting in connection with this chapter, because it illustrates the difficulties in applying a system of marking such as is used in the regular schools to the work and progress of students in a vocational school.

Education of Girls and Women for the home in its several variables. Snedden, V. E. M. Vol. I, No. 2.

A general discussion of the difficulties of securing efficient vocational education work in this field with some suggestions as to standards and procedures.

School Catalogs

A number of day vocational schools publish catalogs and other descriptive material. These give a very good idea as to objectives, organization and operation of such schools. This material can usually be secured without cost by writing to the school. It would be impossible here to list all of these schools, or even any great number of them. Those mentioned below have been selected because they are typical of certain forms of organization. Of course, the authors can assume no responsibility for the success or failure of a reader in securing material from any of these schools:

The Worcester Trade School for Boys, Worcester, Mass.

This school aims to produce fully trained apprentices at the end of a four years' course (in a number of skilled trades). It conducts its own shops and trains on productive work. It is organized on the basis of a

weekly alternation of students between the shop and the school part of the program.

The William Hood Dunwoody Industrial Institute, Minneapolis, Minn.

An endowed institution conducted largely on the opportunity basis of organization. Deals with a considerable number of skilled trades. Publishes much descriptive material. Is one of the few schools in the country that gives training in baking and in milling.

The Beverly Industrial School, Beverly, Mass.

A machine shop school that is one of the best examples of efficient cooperation between a large manufacturing corporation and a publicly controlled vocational school.

The Worcester Trade School for Girls, Worcester, Mass.

A trade school for girls corresponding, in general, to the boys' trade school mentioned above.

The Boston Continuation School, Boston, Mass.

A typical continuation school whose chief aim is that of assisting pupils to efficient social adjustment.

Other schools that might be mentioned are:

The Agricultural Department conducted in the High School at Albert Lea, Minnesota.

The Manhattan Trade School (for girls), New York City.

The Delgado Trade School, New Orleans.

Hampton Institute, Hampton, Va. (colored).

Tuskegee, Tuskegee, Ala. (colored).

Wentworth Institute, Boston, Mass.

The Springfield Cooperative School, Springfield, Vt.

The schools for trade training conducted by:

Cleveland, Ohio (cooperative apprentice schools).

San Francisco, Cal. (cooperative apprentice schools).

Chicago, Ill.

New Bedford, Mass.

Holyoke, Mass.

Kansas City, Mo. (girls' trade school).

Bridgeport, Conn.

New York City (textiles especially).

Directory of Trade Schools. Federal Board of Vocational Education. Bulletin No. 99. C. F. Klinefelter.

This bulletin is just in press and gives a directory of practically all the federally aided vocational schools in the country, with the trades taught.

From the foregoing sources any interested reader should be able to secure sufficient descriptive material to serve as a basis for the comparative study of different types of vocational schools dealing with adolescents. Since almost all vocational schools in home making and agriculture are organized as departments in public high schools, they do not, as a rule, publish any special descriptive material. The same may be said as to commercial courses. As a result any information that may be available is generally contained in the annual reports of the School Boards of the cities and towns where such work is conducted. Independent or endowed schools are much more likely to publish more detailed descriptive material; hence the comparatively large number of such schools mentioned in this list.

CHAPTER XII

THE VOCATIONAL SCHOOL FOR ADULTS

The two previous chapters dealt entirely with the full time school and its work with adolescents. As was pointed out, the modern day school also serves more and more those adults who, while out of employment, want intensive training for some occupation. The needs of the great mass of mature wage earners are still met by the evening school and probably always will be. In many places evening schools are a part of the day school. Very often they are operated in communities where no day school is maintained. Since the problems of vocational education for the adult are usually the same, whether he attends a school in the day time or in the evening, they are discussed together in this chapter.

Factors to be considered—Any discussion of vocational training for persons already employed must consider certain factors which considerably affect many questions in the organization and operation of the work. Among the more important of these factors are: First, the characteristics of the adult group; second, the working conditions under which training is given; and third, the character of the needs to be met by training.

Two characteristics of the adolescent—the fact that he is immature and therefore still in the forming period, and that he is being trained as a novice previous to real employment—have unquestionably affected, and properly so, the attitude of the day school toward him. Consciously or unconsciously any school dealing with adolescents has assumed a certain paternal attitude toward them. In developing vocational education for adults one of the serious difficulties has been the tendency toward this same feeling of responsibility for the morals, behavior and general well-

being of students. This has cropped out in a number of ways which have unquestionably interfered with the efficiency of school work with adults and many of which have led to undesirable and sometimes ridiculous situations.

A group of firemen, for example, are being given certain instruction which will aid them to pass the examination for a steam engineer's license. If it happens to be a warm night, is there any real reason why these men should not take off their coats and vests and work in their shirt-sleeves and suspenders? As the instructor is a steam engineer also, is any catastrophe likely to happen should he, too, remove his coat and vest? It may sound unbelievable, but just this sort of thing has been criticized on the ground that it is not dignified on the part of the teacher and bad manners on the part of the students.

Group characteristics. The adult worker in any occupation who turns to the vocational school for assistance is a mature, self-respecting citizen and a tax payer. Usually he is already discharging the duties of a citizen and often is the owner of a home and the head of a family. Many of these same facts are equally true of a competent woman employed as a housewife.

Such people do not come to the vocational school unless they know what they want, and expect to get it. They will not remain if they do not get it. They feel entirely capable of taking care of themselves and of regulating their own morals and their own manners. Usually they are also extremely desirous of giving no offense to others in these matters. They cannot be treated like children, and no school, public or private, has any occasion to stand "in loco parentis" toward them. They are always quick to detect and resent attempts to do so.

Working conditions. Children are accustomed and required to attend long prescribed courses of instruction often regardless of their interest or profit from them. Not so with the adult wage earner who, as a voluntary student, always attends with a motive. That motive is to learn very definite and specific skills

or knowledge that he can use to meet present difficulties in his occupation, or to secure better wages and a better position.

Consequently, he will not attend a long course of instruction when the only thing he wants is some item or small group of items covered somewhere in that course. An experienced garage worker may need very much to know how to handle difficulties in the starting and lighting of automobiles. In a short course, he can be taught this directly for use. But he finds no balm in Gilead when the school offers him a course in theoretical electricity that does not bear directly on his problems or in a general automobile course in which he is required to attend for two years of instruction on all phases of the automobile, in order to get what he needs about starting and lighting. These facts would seem to be perfectly obvious to any person of ordinary intelligence, yet it has not been many years since it was common to find evening vocational schools offering only long courses from 20 to 35 weeks and requiring all students to enter at the beginning of each course. As one advocate of this plan described the situation, "They must take it all or none."

The character of the needs to be met. In one particular school with which one of the authors at one time had quite intimate contact, it was common to have an initial enrollment of from 1,200 to 1,500 in evening classes which were organized to run about twenty-five weeks, two nights a week for each class. The range of subjects offered was extensive and vocational in character.

This large enrollment certainly testified to the desire of these workers for training which they could use effectively in their work. As a matter of fact, the total number who stayed through these long courses of instruction, ranged, in different years, from 100 to 200. A number of classes had no attendance weeks before the end of the course. Others had only a small percentage of survivors out of the original enrollment.

In considering what this meant, it must be remembered that

these students were not adolescents, but mature working men and women. After a hard day's work they enrolled in these classes in order to secure some form of training that they knew was needed in order to better themselves in their occupation.

There was probably something in each course which every man or woman who enrolled in it wanted to get. They had, however, neither the time nor the inclination to struggle through a lot of work, however valuable to somebody at some time, which was not valuable to them at that time, and to do this just for the sake of securing the particular bit of training which they wanted and needed.

In most cases this particular bit of training could have been secured in a few lessons.

The position of the school authorities was that all students should take these long courses or nothing. Whether a student wanted or needed everything in the courses in which he enrolled, the whole content of the course was "good for him anyway." He should submit to it all for the sake of getting the little bit that he really needed and knew that he needed.

The answer of the students to this was given in the registration and school mortality figures. Most of them gave up in disgust soon after registering and the rest quit soon after the course had reached the point at which they gained the particular thing they desired, or abandoned hope of ever getting to it.

The effect of introducing short unit courses—As short unit courses were developed and the long courses in adult vocational schools have been broken up into shorter ones, each bearing on some important subject, it has not been at all uncommon to find that 85% to 90% or even 100% of those who enrolled at the beginning of each unit course attended throughout the entire period that the unit was given. The substitution of a series of short unit courses for each long course gave an opportunity for these men and women to register when each unit started and so get what they wanted and only what they wanted. No comment

is needed here as to the greater social value of an evening vocational school when it is organized to serve the real needs of working people rather than to vindicate some preconceived and paternalistic notion regarding which people should want and must take.

Administrative devices—The special administrative devices which apply particularly to the vocational school for adults are: first, the almost exclusive use of the short unit course; and second, an organization so flexible and so fluid that it can meet the specific needs of any group when that particular group appears and asks for assistance.

The use of the short unit course. Reference has already been made quite frequently to the short unit course as a device in "pusher education" for meeting in a direct and specific way the occupational needs of adult wage earners. It remains here to illustrate the way in which these courses should be organized and conducted in evening schools.

A certain privately endowed industrial and trade school gives extension training in its evening classes annually to about 2,500 workers employed in some 65 different occupations. Instruction for each of these occupations is given in a series of short unit courses, each bearing on some important phase of the work. A general course or courses is also offered for each important trade or industrial employment, for example, these five general courses in building construction: for journeymen carpenters; for cost estimators of small structures; for cost estimators of large structures, a concrete course for building construction men; and one for concrete workers. Each general course, however, is only a series of the short unit courses, required for a diploma. Credit is given the student for each unit of instruction successfully completed. At the close of each evening school year a certificate is issued to him stating what unit or units he has finished during the year in a satisfactory manner. When these certificates show he has met the full requirements of the general course, a diploma is issued to him.

In the special bulletin issued annually on the Building Trades, each of these general courses is presented as a series of short unit courses. "The General Course for Journeymen Carpenters" will include the following short unit courses:

- "BC- 1 Shop work in houseframing, 10 lessons
- BC- 2 Shop work in roof construction, 20 lessons
- BC- 3 Shop work in stair building, 10 lessons
- BC- 4 Shop work in outside trimming and interior finishing, 5 lessons
- BC- 5 Mill room practice, 5 lessons
- BC- 6 Builders' hardware, 5 lessons
- BC- 7 Saw filing, 5 lessons
- BC- 8 Mathematics for carpenters and bricklayers, 20 lessons
- BC- 9 Elementary sketching and drawing for carpenters and bricklayers, 10 lessons
- BC-10 Elementary plan reading for carpenters and bricklayers, 10 lessons
- BC-11 Taking off quantities and study of building materials, 10 lessons.

"To secure a diploma in this course, the student must present evidence that he has had three years' successful experience in the trade. Unit courses 6 and 7 are optional courses and may be substituted for the ten lessons required in any one of courses 1, 2, 3, 4, and 5. The shop work of courses 1 to 7, inclusive, may be taken before or after classroom work of courses 8 to 11, inclusive, and in any order in which they are offered by the school. Courses 8, 9, 10, and 11 must be taken in the order given."

The units of these general courses are not offered simultaneously but usually follow each other tandem style so that a student may enter at the beginning of the evening school year and take one unit after another during the year, or enter at any time when the unit he wants is offered and depart when he has received the help he

needs. Frequently different units of a general course are offered during the same period, but not on the same night. Usually when this is done one unit is offered as class instruction and the other as shop work. Where the demand exists, any given unit will be repeated as many times as necessary during the year. The whole arrangement has been aptly styled a combination of cafeteria and table d'hôte service since the student may either call for what he wants or take the whole bill of fare (instruction). To facilitate this, every bulletin states definitely for each unit course the nights on which it is offered and the exact dates on which it begins and ends. The following illustration taken from the Bulletin on Building Construction deals with the units of the General Course for Journeymen Carpenters listed above.

"The unit courses offered in 1923-24 are given in the following list, together with a statement opposite each, of the nights in the week on which the unit is taught and of the dates when the unit begins and ends.

- | | | | | |
|--------|--------------|-------------------|--------------------|--------------------|
| BC- 1 | (10 lessons) | Tuesday, Friday; | begins Oct. 2nd, | ends
Nov. 2nd |
| BC- 1a | (5 lessons) | Tuesday, Friday; | begins Nov. 6th, | ends
Nov. 20th |
| BC- 2 | (15 lessons) | Tuesday, Friday; | begins Nov. 23rd, | ends
Jan. 25th |
| BC- 3 | (10 lessons) | Tuesday, Friday; | begins Jan. 29th, | ends
March 7th |
| BC- 4 | (5 lessons) | Tuesday, Friday; | begins March 11th, | ends
March 25th |
| BC- 5 | (5 lessons) | Tuesday, Friday; | begins March 28th, | ends
April 11th |
| BC- 8 | (20 lessons) | Monday, Thursday; | begins Oct. 1st, | ends
Dec. 13th |
| BC- 9 | (10 lessons) | Monday, Thursday; | begins Dec. 17th, | ends
Jan. 28th |

BC-10 (10 lessons) Monday, Thursday; begins Jan. 31st, ends
March 3rd

BC-11 (10 lessons) Monday, Thursday; begins March 6th, ends
April 7th."

These bulletins are widely distributed every year to all former day and evening pupils and to inquirers and to prospects. The courses are widely advertised in various forms. Over the time clock or on the bulletin board of manufacturing establishments, for example, is placed the list of unit courses for that line of employment, always with the specific dates on which each unit begins and ends. In the local papers a statement is published at the close of each month about the new unit courses starting at any time during the ensuing month. In this way virtually all interested workers of the community know what different helps are available at the school for their respective lines, and when each help starts and finishes during the year. The result is that they have become accustomed to registering at the proper time for any work they want and appear at the school for this purpose exactly as they would go to a depot to take a train scheduled to start at a fixed hour.

As the result of this plan of organization and policy of catering to the real needs of working people, these extension classes have in eight years increased from 1 to more than 200; the occupations dealt with from 1 to 65, and the registration from about 25 to almost 3,000. Undoubtedly there are some workmen in every city who will and do attend general evening courses. Without question such courses have been of great personal value to such students and of large social and economic value to the community. But the problem of mass training is one of pusher education when needed, a service which for the overwhelming body of our wage earners requires the organization of extension instruction on the short course basis.

Flexible and fluid organization. The organization in fact

should be that of an opportunity school. It must be possible to establish units as the need appears, and discontinue them as soon as that need is met. An illustration may make this plain: An evening course in ornamental plastering was held several years ago in the city of Holyoke. There were significant things about this course, but one or two have special bearing here.

Suddenly a building program developed in the city which called for a considerable amount of high grade work in ornamental plastering. Aware of the fact that they could not meet this demand, the local plasterers applied to the local vocational school for training. These men were asked just what they wanted to be taught and the course was set up accordingly. An expert workman from another city was secured as instructor, since no local man was sufficiently advanced in this branch of the trade. The course was then given to a group of men who comprised almost all of the plasterers in the city.

As a result of the training, they were able to do the more skilled work required by the building program. After their needs had been met, the course was discontinued. As a matter of fact the short courses so given for two years paralleled the development of the construction called for by the building program. This was real "pusher education" through a flexibly administered evening school using the adaptable device of the unit course to meet a very definite emergency demand for help through specific training.

It is the ability to meet the emergency demands for the training of commercial workers, both adolescent and adult, which accounts in great measure for the success of the private commercial college. For a long time it has employed all these special devices in vocational education for any field with which it dealt: the wide open door for admittance, short instead of long courses, admission at any time, individual instruction, practical instead of academic tests, standards in performance as the basis of promotion in school, and of recommendation and placement in employment. One of the most successful business schools in the country admits

pupils every Monday and graduates a class every Monday. It is this desire to secure training at the time needed which is catered to especially by the correspondence schools. Vocational education under public control has many things to learn from these commercial institutions, not the least of which is the effectiveness of striking when the iron is hot.

Courses and methods—All that has been said with regard to courses and methods in the adolescent school apply with equal force in the training of the adult worker. So far as content or subject matter goes, one or two facts are worth mentioning. An adult worker rarely wants a continuous organized course in shop practice. If he wants training on the shop side, he almost invariably wants some specific form of training. A man employed as a lathe man in a machine shop rarely if ever wants a complete course in machine shop practice. He wants to know how to operate another machine such as a shaper or grinder or a machine of a different type from the one on which he is employed. So true is this that almost all of the more efficient vocational schools operate their shops in the evening primarily as pure "opportunity shops" giving students an opportunity to secure training on different kinds of work according to the special things which each man wants—a program for each student that is limited only by the equipment of the shop and the time at which any machine needed for his training is available. On the whole, however, the great mass of adult workers look to the vocational school for the technical rather than the manipulative side of their trades. The lathe man wants to know how to read blue prints. The house carpenter wants to know how to cut out rafters by the use of the steel square; the printer how to make layouts; the woman in the home how to plan her budget or select and buy to better advantage or how to educate and care for her children properly; the farmer how to handle the managerial side of his farm.

The call or emergency staff—In an earlier chapter the qualifications of teachers for day schools were discussed in considerable

detail together with some comments upon teacher training. In vocational training for adults, the day school naturally, so far as may seem advisable, uses the members of its teaching staff both in the daytime and in the evening. If these teachers are qualified for the work of the day school in personality, experience and ability to teach, they will usually succeed equally well in dealing with adults. Under most conditions, however, we either have an evening school with no day school or we have an evening school calling for a much larger instructing staff than that of the day school. One of the serious problems has been how to secure this additional staff and how to give them the necessary training for teaching.

Let us take as typical an evening extension school where the work for adults is based on the idea of giving any man what he wants when he wants it. This means a constant shift or flux in student body and a constant adaptation and readaptation of courses. Old unit courses constantly disappear or are modified and new ones constantly come to take their places.

It is evident that there can be no such thing as a permanently employed staff in such a school. Instructors must be employed and released as specific demands appear and are met. A group of carpenters employed on wooden house construction, for example, are at liberty for a month during the winter on account of the closing down of building operations, this being in most parts of the country a seasonable trade. They apply to the vocational school for a unit of instruction in the reading of blue print layouts for roof frames. At the same time, a group of power house electricians apply for a unit course in the operation of A.C. generating equipment, while 25, 30 or even 40 groups of men and women apply for similar specific work in different lines.

The only way to meet this situation is to draw instructors from the occupations themselves. This is usually not so difficult if the work is given in the evening as when it is given during the day. Where only one or two individuals apply for a special or dull

season course in the day school, they can usually be taken care of by the regular staff. Even then, however, it is often necessary to secure a special instructor. Evidently the only way this situation can be met is by the gradual development of what may be called a "call staff." Competent men and women must be found who can be called upon whenever their services are required and can be released when their services are no longer needed. The ordinary occupations of this call staff must include all those in which the school is prepared to offer opportunities for training.

This seems a very difficult administrative proposition to those who are used to the regular organization and standard staff of the regular schools. As a matter of fact it has not proved difficult except in the way that it requires more time and ingenuity on the part of the administrator. There are many vocational schools in this country who have so built up a very effective call staff. Of course the personnel of this staff changes somewhat. When it has once been built up, however, it really requires only slight changes as new demands arise. One institution handles normally about 2,000 to 2,500 adult men in the course of a year. It gives on an average anywhere from 50 to 75 different courses representing as many differing specific group demands. It has built up a very efficient call staff of 150 to 200 men, all of whom are employed in regular occupations, but who can be drawn on for instructing services whenever these are required.

Qualifications of evening instructors—For a long time it was assumed that the qualifications of an instructor of adults must necessarily be the same as those of the instructor of adolescents. It has already been pointed out that a properly qualified instructor of adolescents can work successfully with adults. Experience has shown, on the contrary, that the complete equipment required by the former, while desirable, is not necessary for the latter. The one essential requirement for a trade extension instructor is such a standing in his regular line of employment that other workers in it recognize him as being as good a man as there is.

The one great asset of the trade extension teacher is the occupational respect of fellow workers. If a man employed as an instructor is recognized as an expert in his occupation, he possesses this great and fundamentally necessary asset for successful teaching. Failing this, he cannot handle the work efficiently. Unless they believe he is a better man in the occupation than they are, self-respecting, mature, competent workers do not consider it worth while to spend their time and energy working with an instructor.

Given on the one hand a group of men or women who want to know or want to do, and given on the other hand an instructor who does know and can do, the group will get what they want somehow. The foregoing statement is not intended to belittle the fact that some knowledge of the simple principles of teaching is just as advantageous in this work as with adolescents. Occupational mastery acquired in the occupation and the ability to teach, acquired somehow, may be given as the two essential qualifications of the instructor of adult groups.

Teacher training—The preparation of instructors employed exclusively in evening schools has, up to the present time, received but little attention. It has generally been assumed that the same training course was required as would be given to prospective teachers in the day school for adolescents. While such training is desirable, recent experience has indicated that much briefer courses will give valuable results. In a number of cases such courses dealing almost exclusively with the effective use of the formal lesson have been found to increase greatly the efficiency of the trade extension instructor. With a working mastery of the use of the formal lesson easily gained, any evening school teacher who "knows his stuff" from his own occupation can present it much more logically and clearly as preparation, demonstration, application and testing. Courses that are as short as ten to fifteen hours have proved to be of great value in promoting this ability.

Whatever may be the length of a training course for teachers of evening classes, it is obvious that it cannot be given on the campus of any teacher training institution. All the members of a call staff are employed in their regular occupations during the day and their employment as instructors is merely incidental to their regular business. It is patent that any teacher training work for them must be carried on in the locality where they are to do their teaching. Consequently, help for them in their evening school problems must be given either by an itinerant teacher trainer, or by local teacher trainers. In at least one case, an attempt has been to deal with this problem by correspondence courses. The experiment has not yet been carried to a point where its benefit can be definitely ascertained. It is reported, however, as being apparently of enough special value to warrant its use where no better method of teacher training is available.

The equipment of the vocational teacher—It may be well to close this chapter with some reference to the general theory of teacher training in vocational work. The equipment of any vocational teacher is of two kinds: First, he must have an adequate command of *content* in the occupation, secured through actual participating experiences—a mastery of the thing he is to teach; second, he must have the necessary professional equipment which will enable him to instruct, to impart information, to organize experiences, and to do all this by the selection and use of the most efficient methods under the working conditions. This situation may be represented by the formula: $I \propto C + P$, in which "I" stands for the qualified instructor; "C" for his command of content; and "P" for his professional training in teaching. There have developed three ways of securing the individual so equipped: Evidently, in theory we can give both "C" and "P" in an institution. We can secure a group possessing "C" and give them "P." We can get a group of individuals who have already secured professional training, "P," and give them the practical experience necessary to a mastery of the content, "C," to be taught.

The first plan is that followed in the education of teachers in manual training and industrial arts by regular or special normal schools. In the course of a residence of from two to four years on the campus the prospective teacher is given both occupational experience and professional training. The third method has been but rarely tried. A few industrial plants have, for example, secured instructors for the training of their own employees by selecting successful teachers from the general schools and putting them at work in the plant to learn what they are later to teach others. The second plan has been followed most extensively in genuine vocational education. Adequate participating experiences in an occupation are required as a prerequisite to the training course, and the training course is open only to the group able to meet this requirement.

There is no question that the plan of giving professional training to prospective teachers who have already secured an adequate occupational experience is by far the most efficient, the shortest, and the least expensive. It is also the one which offers the most promise.

Professional improvement—It is now generally recognized in vocational education that no teacher training course should attempt completely to equip a teacher on a pre-employment basis. Most effective teacher training must be done on a trade extension basis subsequent to employment. This is also recognized in a number of states and provision for carrying it out in practice is being rapidly extended. Under this scheme the teacher training agency, whatever it may be, continues to provide some form of teacher training after teachers have secured employment. No teacher training plan can be considered efficient unless it not only provides such pre-employment instruction as will enable the novice teacher to hold his own during his first experience in teaching, but also provides further training while he continues in the practice of his profession.

QUESTIONS AND POINTS FOR DISCUSSION

1. Make a list of the administrative difficulties in conducting an evening school, on the basis of the "cafeteria" and "call staff" organization.
2. Outline a method that you consider would be effective in dealing with each of these difficulties.
3. To what degree, as you see it, have the traditions and standard practices of the evening academic school been effective in retarding the development of efficiently organized evening vocational schools? Make a list of these "inherited inhibiting factors."
3. Make up the content of a short unit course of not over six hours to handle the needs of a group of men as indicated below in the suggestive subjects:
 - a. Rewiring the ignition circuit on a Ford. (Or any other car with which you are familiar.)
 - b. Selecting seed potatoes. (Or other seed.)
 - c. Buying a ready made woman's winter coat. (Cloth.)
 - d. Case hardening.
 - e. Finding altitudes by the use of triangulation. (Quadrant or theodolite.)
 - f. Cutting rafters by the use of the steel square.
 - g. Paragraphing and punctuation for linotype operators.
 - h. Operating the special attachments on a domestic sewing machine.
 - i. Writing business letters. (For employed stenographers.)
 - j. Making frozen sweets. (For women employed in the home.)
 - k. Planning a family budget.
 - l. Making baby clothes.
 - m. Plastering on lathed partitions.
 - n. Timing gas engines. (Marine or automobile.)
 - o. Repairing watches. (Custom work.)
 - p. Operating power paper cutters.
 - q. Figuring offsets on an engine lathe.

If unfamiliar with any of the preceding units, use similar subjects drawn from the content of some occupation in which you are yourself a competent worker. It is assumed in each case that the content of the unit will be of direct benefit to workers employed in the occupation and wanting the training as a means to better wage or promotion.

4. In two parallel columns set up the characteristics of the student attending an adult vocational school and the student attending a day school for adolescents. Use at least the headings given below and such others as you may think have a functioning value.

- a. Stage of biologic development.
 - b. Occupational background.
 - c. Knowledge of what he wants.
 - d. Clear understanding as to why he wants it.
 - e. Clear understanding as to why he wants it now.
 - f. Self-assertiveness.
 - g. Fatigued condition when in the class.
5. In connection with the conduct of certain teacher training classes and foreman conferences it has been customary for the men to smoke and chew tobacco if they were in the habit of doing either or both at other suitable times and places. In a number of cases the instructor or conference leader has also indulged in either or both habits while conducting the class or the conference. List out the objections to such a procedure assuming that no offense was given to other members of the group.
6. How much of the discipline and standard procedure of a regular high school would work with adult groups, such as:
- A percentage marking system.
 - Written examinations.
 - Punishment of any kind for infractions of discipline.
 - The exercise of authority on the part of the instructor.
 - Marking for tardiness.
 - Requiring an explanation for cases of absence.
 - Any others that you can think of?
7. In a certain evening school with men coming by trolley from a large surrounding area, the rule applying to the general elementary schools of the city that no pupil was to be admitted to the building more than five minutes before the school started was enforced. Was this good or bad management on somebody's part? Why?
8. Which is the more efficient method of the two outlined below:
- a. Preparing certain courses in advance; securing competent instructors; advertising these courses; taking registration for them; and giving those courses for which a sufficient registration is secured.
 - b. Advertising a general opportunity for vocational training for adults; setting a time for them to come to the school and make their wants known; agreeing to give such work as meets the stated demands of all groups of fair size; telling them to come back in a week; and proceeding to hunt up a competent instructor.

9. Analyze the relative advantages and disadvantages of the two methods from the standpoint of:
- a. Easy administration.
 - b. Maximum social service.
 - c. Probable efficiency of the training.

BIBLIOGRAPHY

Statement of Policies. Federal Board for Vocational Education. Bulletin No. 1. (Revised Edition. May, 1922.)

This bulletin contains statements of policies of the Board and includes a large number of answers to questions of an administrative character, a number of which apply to vocational schools for adults. The appendix includes the text of the National Vocational Education Act in which are various provisions affecting the administration and operation of schools of this type, if Federally aided.

Trade and Industrial Education for Girls and Women. Federal Board for Vocational Education. Bulletin No. 58.

This bulletin includes considerable material relating to the establishment and operation of evening schools for adult women.

A Unit Course in Swine Husbandry. Federal Board for Vocational Education. Bulletin No. 68. (In cooperation with the Department of Agriculture. C. H. Shopmeyer and C. H. Lane.)

This bulletin outlines a course of 17 units in this subject. It illustrates the application of the short unit idea to the agricultural field.

Trade and Industrial Education. Federal Board for Vocational Education. (Organization and Administration.)

This bulletin contains a section on evening trade extension schools dealing chiefly with the administrative side of the problem. It includes such matters as qualifications of teachers, restrictions on attendance, necessary plant and equipment and such other matters as affect approval for Federal Aid.

Evening and Part Time Schools in the Textile Industry of the Southern States. Federal Board for Vocational Education. Bulletin No. 30. Roy Dimmitt.

Part 2 contains a long list of unit courses in the textile industry which are excellent types of the short unit as applied to a production flow industry using specialized machines of moderate complexity of control.

Home Economics Education. (Organization and Administration.) Federal Board for Vocational Education. Bulletin No. 28. Berry and Richardson. (Revised Edition, 1924.)

One section deals with evening classes for adult women.

Clothing for the family. Federal Board for Vocational Education. Bulletin No. 23. L. I. Balt.

Contains a large number of unit courses in this field of vocational education. (Superintendent of Documents. 15 cents.)

Use and Preparation of Food. Federal Board for Vocational Education. Bulletin No. 35. W. Windsor. (In cooperation with the Department of Agriculture. Bulletin No. 35.)

Contains a large number of short lessons in this field.

CHAPTER XIII

THE GENERAL CONTINUATION SCHOOL

The compulsory continuation school a new social agency—Compulsory part time attendance laws have recently established a new training device for juvenile workers in towns and cities. These state laws require all permit workers over 14 years of age, who are legally employed, to attend school for a period of from four to eight hours per week, out of their working time. In some states these regulations apply to those under 16 and in others to those from 14 to 18 years of age. By this legislation, states have asserted their wardship over the education as well as the work of young wage earners within the prescribed age limits. In order to insure for them the benefit of this schooling, attendance has been made compulsory and compliance with the regulations is enforced by penalties upon employer, parent and child.

However it may be phrased, the assumed objective of these schools is to promote the civic and vocational intelligence of those who have left the schools early to go to work. Since most permit workers are employed in temporary juvenile occupations, very few of these compulsory schools are called upon to give trade extension training for any skilled or permanent employment. Because they give general rather than trade training, they are technically known as general part time schools. In popular discussion, they are perhaps quite as frequently called continuation schools—a phrase borrowed from the Germans, to indicate that they provide a continuation of education after the close of full time attendance.

The situation precipitated—Thus far, twenty-seven states have

established these schools. The Report for 1923-24 of the Federal Board for Vocational Education shows a total of approximately 256,000 pupils already enrolled in them. This is more pupils than the combined school population of the states of Arizona, Delaware, Nevada, Vermont and Wyoming, and represents a school population greater than that of a city of 1,000,000 people.

Most of these laws and the resulting schools are developments entirely of the past five years. Sweeping legislation precipitated the problem because there is no other way in a democracy to get things done. No one, apparently, knew exactly what the job of the continuation school was or how to do it. There was no time to learn except by experience. There was no equipment, courses, methods, money or specially trained teachers available. In this condition, these new schools were committed to the public school systems of the various states where naturally they fell into the hands of those knowing only traditional education.

Old ideas for a new and vital problem—Here and there some excellent work has already been done with this difficult problem. Almost everywhere, however, the public schools were engrossed and burdened with the affairs of the full time or regular group of students. Few teachers and still fewer superintendents wanted the permit worker and his problems. Most of them disbelieved for one reason or another in the wisdom of the plan. Chief among these reasons were these motives and points of view: that the working youth is less capable and therefore less desirable as a student of academic subjects; that he should drop his work and attend the full time school if he wishes any further education; that it is a bad precedent to use public funds on any other group than those remaining in the full time school; that the short time available in the part time school makes it impossible to teach anything worth while; and more particularly, that all the money of the school system is needed for the more important duty of doing more and better things for those who are able and willing to attend full time.

Taking the easiest way—With exceptions here and there, which make them conspicuous, those in authority over these new and experimental schools, struggling from the start against almost every conceivable difficulty and obstacle, have, in discharging their legal responsibility, taken the easiest way. They have housed the new work wherever was most convenient and economical to the administration, often in abandoned school houses. Very frequently discarded equipment has been turned over for use. The number of cities in which special provision has been made for housing and equipping this new and critical work could be easily counted on the fingers of two hands with fingers to spare! Although the problems confronting this new device for training youth call for the highest type of manhood and womanhood as well as of pedagogical skill, the poorest instead of the best teachers have too often been "promoted" to this service.

The easiest way was to assume that the aims and problems of the part time class are identical with those of the full time school and that they differ only in the grade of student and the time available for instruction. Consequently, we find almost everywhere a continuation of the regular standard subjects, standard teaching material, and old teaching technique. We find also the use of the standard regular school organization and procedures in all their details. Discipline, for example, is handled in the same way for these independent wage earners as for sheltered children. Instruction begins in the same subjects and at the same pages where it ceased in the full time school work of pupils. Book work is still the basis of instruction. Second hand or pseudo experience furnishes the teaching stuff. The formal lesson reigns supreme. Memory is still drilled and thinking stuff neglected. Academic standards and tests are the basis of grouping, grading, and promoting pupils. Individual needs are lost sight of in the relentless march of class instruction, class testing and class progression.

The foregoing picture is not overdrawn. Those part time

officials and teachers who are keenly alive to the real problems and responsibilities of these schools know that it is a correct one.

The situation just described is not universally true, however. Here and there, in the larger cities, the work has fallen into the hands of capable leaders who are accomplishing results that justify the legislation and the program and point the way. Notably is this the case in Wisconsin, where from the start the movement was put into the hands of State and local boards keenly interested in the problem and filled with a sense of their responsibility for employed boys and girls. They provided adequate support and set up as the social objective of these schools the adjustment of working youth to the social job: an aim to which they have held and which they still hold.

The continuation school a new and distinct problem—Already experience has taught even most of those committed to traditional school ideas that the part time school is, in all its aspects, a distinct entity and problem which requires special objectives, organization, and procedures. Certain things have become apparent to every open mind: The old subject matter taught in the old way does not work. Working youth are not interested in it because it does not appeal to their interests and they cannot use it. Even if they could, the limitation as to time makes its use a waste of money. The real needs of juvenile workers are immediate and definite. They are readily discernible to those who know the adolescent wage earner and his problems. Service for them requires the meeting of these needs. They cannot be met by formal subject matter, abstract teaching or traditional methods.

Furthermore, the problem of training permit workers cannot be standardized as to groups, needs, objectives, subject matter, methods, organizations, equipment or any other item. None of the traditional procedure works with this group. A special teacher having understanding of youth and work, a winning personality and resourcefulness in the use of participating experience and individual training is the only kind to whom permit

workers should be entrusted. Otherwise the results are likely to be anti-social. Most of the vocational education procedures do not work either. While national and state laws have provided for these compulsory continuation schools as a part of the vocational education program, they are a separate and distinct unit, differing in most essential respects from the day trade school and the part time trade extension school. Their purpose is not of necessity to train in skills or in thinking about skills, but in living and thinking about living. This objective presents in those schools, under the given conditions, a distinctly new field, service, task, procedure and opportunity.

The continuation school and the social job—As the work has developed, many engaged in it have come to realize all these things. They are now earnestly trying to find what the continuation school job is and how it can be done. While most of them find themselves hampered in all sorts of ways, they have, in their thinking at least, come to certain conclusions which may be stated as follows: The biggest job of the continuation school is the promotion of the adjustment of juvenile workers to the social job—helping them to better living and better thinking about living. This social adjustment lies in three main fields: 1. the establishment of social attitudes and social habits; 2. the capitalizing of the material or economic assets of the youth; and 3. the development of personal interests and assets for the better enjoyment of life. Certain negative conclusions have also been drawn from experience. General education is not the main job of the continuation school; vocational education is not the main job; the employed boy or girl requires a different personnel management from the full time school boy or girl.

All this amounts to an interest creating, attitude inspiring, habit promoting, thought developing program such as can rise only from a wide range of real experiences and functioning teaching material. Life is many sided and human beings, even working boys and girls, present an infinite variety of interests, abilities,

aptitudes, traits and situations. Such a program obviously leaves the continuation school facing many things calling for experiences which it does not know how to get or control, or how to teach to its pupils. Particularly is this true in the field of social attitudes and habits, a difficulty which has made controlled civic training in all schools such a disappointment. This program calls for a flexibility in all the organization and procedures of the part time class, a flexibility which to many sincere school men amounts to chaos. It also calls for a kind of resourceful teaching that is beyond the ability of many instructors serving satisfactorily in full time school positions.

Realizing the situation, many part time teachers have sought earnestly to make pronounced changes in the aims and work of their schools. Some of them have been repressed in this effort by the school authorities, sometimes because of the honest conviction that the program in operation was the only one workable; sometimes because of the inability of these teachers to offer anything tangible in its place, but usually because of the feeling that any other program was so difficult in its demands as to make it a dangerous if not impossible innovation. Some of these dissatisfied part time officials and teachers have won their cause and are now on their way to better things. Some who lost have retreated to the public where they have defended their work by rather extravagant statements of what the continuation school aims to do and what they hope at least it is doing for a sadly neglected group. Still others have compromised the whole matter by introducing new topics as subject matter but teaching them with the use of the same abstract presentation, the same cold storage treatment, the same old teaching technique.

What is the problem anyhow?—Any plan of instruction for the continuation school that is socially efficient faces this problem: Given 144, sometimes 288 hours, to train working boys and girls, what will you do with this time? What can you do for each individual worker that will be of most value to him and to society?

Three points should be noted in this question. Something is to be done, not for the group as a whole, but for each *individual* pupil, for his needs are individual. This must be done in a very *limited time*. Whatever is done must be the *greatest service*: it must be what will help him most and will help society most. The first two of these points or conditions in the problem are matters of organization, but the last is one of straight thinking about life demands and adolescent workers.

The problem of individual help. The problem of individual help can be solved. As pointed out elsewhere it has been solved by other teachers and other agencies. Almost all shop work in vocational education is individual instruction as is almost all drawing and laboratory work in all schools. Business colleges have, since their establishment, used little group or class teaching. Ungraded country schools have been compelled to handle pupils in all sorts of ways. Other social agencies such as the Boy and Girl Scouts employ almost no other method than personal or individual training. What they have done, the part time school can do if it is provided with willing and able teachers, and is freed from the academic notion that all pupils must be taught in groups, tested in groups, promoted by groups.

The problem of limited time. The time is fixed by law. Assume that the standardized teaching material of the full time school would give juvenile workers help of most value. There is no time to give any amount of it worth while. Much of it would be only a slight extension or repetition of the same kind of general facts which they have been over once. Many of them are not interested in this material, not at least when taught in the old way. Assume that this traditional formal book material does not give help of most value to each individual. Then the use of it is a deplorable waste of the time and energy of teacher and pupils, and of public money.

The problem of greatest service. This problem is one of straight thinking, not of organization. What things are most

valuable to juvenile workers? Of these things, which are given or can be given as well or better by other agencies? Which can no other agency give as well? Which can the school and other agencies best give together? Which can the school handle most effectively in the time available? These are the questions that need to be answered by the part time school at the very outset of its program making: not at which point did this group before going to work arrive in arithmetic and geography and grammar and history and physiology!

The continuation school on trial—The compulsory continuation school will soon be called upon to prove that when it takes 144 productive hours from plant and from pupils, it has given a service worth the cost. It would be difficult for many of these schools to meet the acid test that the social gain justifies the expenditure. The progressive people in the work have by their efforts shown that the job can be done and that the test can be met. After all the suggestions as to what is best and how to teach it, offered in this chapter, are only an organization in more systematic and detailed form of the kinds of things being done by successful part time instructors here and there throughout the country.

What cannot be taught—There is not time enough to teach advanced academic subjects. Certain actual life demands are made on everyone in the elementary arts or mechanics of writing, reading and arithmetic. Because of full time attendance laws most juvenile workers already have this equipment. Further drill on any of these subjects to remove deficiencies is a waste of time. If pupils who took it in the regular schools with their larger time allotment did not acquire standard accuracy in these arts, they certainly will not get it in some small fractional part of 144 hours.

Where illiterates are encountered, they should have training in these indispensable arts of communication up to the minimum of absolute social needs. This raises the question as to what stand-

ard of writing should be required. The answer only to the point of legibility—so it can be read without difficulty. What standard of reading? The answer is ability silently to read and understand shop and bulletin notices and the like, the daily newspaper, and current books and magazines. This has nothing to do with interest and appreciation in reading as an avocation, but only with the mechanics. Once gained, facility in their use will be acquired better by such individual and voluntary reading as the teacher may inspire or the youth elect for himself. What standard in arithmetic? The answer is the ability to use with simple numbers the four fundamental processes of addition, subtraction, multiplication and division; to count money and make change; and to understand, in their relations and equivalents, the simple fractions in common use. But no part of these precious 144 hours for greatest common divisor, least common multiple, interest and bank discount, ratio and proportion and for calculating the areas of imaginary surfaces!

There is no time for fact acquisition for its own sake. Consequently, there should be no time wasted in the teaching of facts for the sake of the facts themselves. Facts the school must have as thinking stuff and for interest and appreciation. But these should be either the facts that come from the participating experience of pupils in the real affairs of shop and home and community, or they should be other vital functioning facts that bear on the specific problems of life and living with which the school should deal. There is no time for sailor geography, for the chronology of history, or for the memorizing of the rules of grammar and the names of human bones! Nor can the part time school undertake in its meager time schedule to train its pupils in personal, economic or social habits on a repetitive basis in the classroom or, for that matter, on the school premises.

These are some things that cannot be taught successfully in the continuation school because of the group characteristics of wage-earning adolescents. Their age of imitation has largely passed.

They are now in the expressing, doing, habit forming period of their lives. They are ready to do more thinking for themselves but they have not arrived at the age of mature reflection and therefore of thinking with abstractions. They want to see and know, test and adopt things for themselves and not upon the mere authority of others. They are interested in a man's work and the affairs of the little economic, or social world in which they move. They want to know ways to do things and get things done. Therefore, knowledge is valuable to them only as it is usable. Nothing they think useless can be taught them effectively, even if it were of the highest value from the social standpoint. They think that, for them at least, all such subjects as Greek, formal grammar, formal geometry, spelling contests on difficult words, sailor geography, drill on historical dates, and formal essays on abstract subjects are useless, as compared with many other things they need and want much more. We agree with them.

There are some things which it is impossible for the continuation school to teach. It cannot teach, for example, traits of character, sometimes called habits of conduct, such as honesty, consideration for others, usefulness, courage, reliability, real courtesy and nobility. These cannot be acquired by preachment and exhortation in any school at least, in spite of the naïve faith that still persists among many teachers. If the work of the full time school has not secured the desired results in character and conduct by the time the pupil has become a wage earner, it is a sad waste of hope and effort to try it on him again when he is a continuation school pupil. Usually the attempt to do it has just the opposite effect from the one sought.

Perhaps of all persons, the adolescent wage earner, in his new and strange independence, has least respect for mere authority and least patience with exhortation. Ideas or notions as to what constitute, under varying conditions at least, honesty or generosity or usefulness involve individual ethical standards, when once we get beyond a few simple and obvious situations and prob-

lems. Generosity is a purely relative term. What is generous in one person is selfish in another and foolish in a third. Every man has his own ethical code and for that matter, every family. Even if the continuation school could establish a very definite code for these traits and habits, the influences outside would militate annually for 365 times 24 hours per day against the effort of the school to control or dictate for 144 hours annually what pupils should think and do.

When employed in preachment and exhortation by the teacher, no matter how earnest, such words as honesty, fidelity, courtesy and the like are mere abstractions or "glow points." The traits of character and habits of conduct which these words try to describe in a general way can never be inculcated by prating about them. They will be inculcated by the example of others—through unconscious absorption and resourceful thinking about what constitutes, under varying situations, reliability, or usefulness, or fidelity or nobility. These two things the part time school can do successfully.

The effort of the continuation school should be confined to what the school can teach better than other agencies. Under the given conditions, it cannot as a public school teach religion successfully. We mean by religion, any interpretation of God or the Scriptures that would be open to sectarian controversy. Some other agencies are not so situated and the responsibility should be placed upon them for teaching religious truth as subject matter. There are other social agencies, such as the Boy and Girl Scouts, the Campfire Girls, the Y.M.C.A., the Y.W.C.A., the Catholic Boys and Girls Clubs, the Jewish Boys and Girls Clubs and the like which furnish young people a better training in certain habits and ideals than the school is able to provide.

The success of such organizations is due to a number of factors. They have more time than the continuation school for their work. Not hedged about by academic standards and restrictions, they enjoy a greater freedom of action. They draw on the real par-

ticipating experiences of their young people for training: a thing difficult apparently for the class of permit workers to do; and they do not attempt to organize their training work in a school way. Whatever the cause, much of the work of such agencies is good. As the agency charged by law with the primary responsibility for the education of the permit worker, the continuation school should use these other agencies for his benefit instead of duplicating their efforts or ignoring the value of their work. A few schools for permit workers have attempted to train them in the special operations of their juvenile and temporary occupations: a thing that is clearly the duty of their employers and not of the school. The same principle applies to the efforts of some general part time schools to prepare those engaged in juvenile employments for more desirable and more permanent jobs. While it is undoubtedly a debatable issue, the authors believe that the use of half the time of this school for sampling a small range of mechanical occupations for purposes of vocational guidance is also, for reasons given in the chapter on *The Discovery and Placing of Ability by Training*, very much open to question.

The real vs. the assumed situation—Any proposal as to what the continuation school should do, other than continue to teach the traditional subject matter of the regular schools in the orthodox way, encounters immediately certain false assumptions which apparently have widespread acceptance. It is necessary, therefore, to compare the assumed with the real situation, which is done briefly in the following table.

If the ideas listed under the assumed situation were true, those educators would be right who contend that the continuation school is only a regrettable device for removing elementary school deficiencies and for increasing the body of standardized facts known to those leaving school prematurely. The authors believe also that, on this assumption, those educators and social workers would not be far wrong who contend that the compulsory continuation school is unnecessary and should be abolished.

TABLE No. 6

Real vs. Assumed Situation as to Part Time Pupils

<i>Assumed Situation</i>	<i>Real Situation</i>
1. Pupils all of low mentality.	All grades of mentality
2. School grade means a definite amount of education in the school sense.	All grades of attainment up to and beyond the maximum set by that grade.
3. School grade means a definite amount of social adjustment.	All grades, degrees and kinds of social adjustment.
4. Only thing to build on is this previous school experience.	Has had 14 to 16-18 years of participating experiences outside.
5. This school experience has been and is the most potent influence in his job.	In terms of time about 1-6 in terms of social adjustment, probably less still.
6. Dominating facts and interests in his job.	May have all sorts of dominating facts and interests.
7. School can always teach him something worth while on his job.	Many cases nothing to teach about the job or its processes and demands.
8. Permanence of employment in present plant or line of business.	Tremendous shift from job to job.
9. Shifting of employment undesirable.	In many cases best thing from standpoint of social results.
10. All home conditions more or less undesirable.	All sorts of conditions.

If, however, the real situation is as we have described it, then this school becomes at once a new and distinct agency for dealing in whatever ways the service may require with the social conservation of adolescent wage earners: one of the most vital of all educational and social problems. What follows in this chapter is based on the belief that our assumptions about working boys and girls are true.

Every one will recognize and admit that all the services to working boys and girls listed above are highly desirable if they can be rendered. Even a superficial examination shows that they cannot be "taught" out of any text book in 144 hours or, for that matter, taught by the use of a formal text, in any number of hours. They are ends or results that cannot be secured by the mere teaching of facts about physical defects or jobs or habits,

nor gained by preachment, exhortation, rewards and punishments. They are concrete helps that cannot be "taught" by abstract subject matter and old teaching technique. Progress of the pupil in them cannot be measured by academic tests or graded on any academic basis, nor can the work be evaluated in terms of credits or the entrance requirements of some higher institution of learning. If all these things are essential to a "school," then the continuation class is not a school. Rather it is a working laboratory about life and a service station for working youth, results of which must be measured only by the degree to which, as someone has so well said, it "definitely puts his feet on the road to somewhere."

What the continuation school ought to do—We recognize that the complete plan or scope of the general part time continuation school should include all the following helps for the juvenile workers:

1. Give every youth as a fundamental service, the necessary minimum of *ability to use the fundamental arts* of reading, writing and figuring.
2. Help him *remove those removable physical defects* that are a handicap to him for life and for work.
3. Help him in his problem of *keeping physically fit*.
4. Help him in his *economic problem* of getting and holding a juvenile job and planning for a more permanent career.
5. Help him in planning and *carrying out activities for his leisure time*.
6. Help him in *acquiring a love of reading*.
7. Help him in *acquiring interests, appreciations and hobbies*.
8. Help him in *selecting and practicing desirable social and economic habits*.
9. Help him in *acquiring interest and initiative in social affairs*.
10. Help him in *acquiring desirable social attitudes and working ideals*.

If we omit the first help of training in the fundamental arts, the remaining nine constitute a complete analysis and statement of the aims and services which the Boy Scouts have provided for the youth of this country. While the Scouts have paid less attention to the economic problems of the boy than the continuation school must obviously give, they have stressed every one of the

remaining eight. Those familiar with the declared objectives of the Scout movement and its procedures will readily recognize that all of them are contained in these helps and needs as listed above: removing physical defects, keeping physically fit, activities for leisure time, love of reading, desirable interests, appreciations and hobbies, desirable social and economic habits, interest and initiative in social affairs, and desirable social attitudes and ideals.

Unfortunately, the Boy Scout movement has as yet reached only a comparatively small group of the great army of American boys. Among the boys reached, those who later become permit workers are very much in the minority. In general, the groups served by the Scouts are under 14 years of age. Consequently, most permit workers have never had the benefit of this training and do not as a rule become connected with the organization after going to work. We are of the opinion that the work of the Scouts is the best social education for boys in the land, and we believe the same, within limits, about the Girls Scouts and the Campfire Girls.

Any continuation school teacher is wise and fortunate who succeeds in organizing his boys or her girls into a Scout group. For our purposes here, however, we desire to say that these helps have been successfully given by the Scouts and that the school will succeed only as it pursues their method. That method is to get the youth to do (practice) simple, desirable things, and out of this doing and thinking and talking about the doing, to acquire desirable habits, standards, motives, attitudes and ideals. Even the Scout book is only a handbook for reference!

An inspection of the foregoing list of deficiencies and needs, helps and services, call them what you will, shows a number of features that need to be pointed out here: 1. They do not constitute a course of study or a list of subjects to be "taught" in the ordinary sense, but a recital of the kind of services working boys and girls need from teachers. 2. As the underscored words show, in every item the youth is to do something, the teacher only

to help him do it better—doing by the pupil, help from the teacher. 3. Every pupil does not need all these helps, nor do pupils needing the same kind of helps have the same deficiencies or weaknesses in equal degrees, a situation that requires much individual treatment of pupils. 4. Help in acquiring certain desirable habits is called for from a teacher who controls a period in the life of a pupil equal to about six full days per year, a service that can be rendered, not by school room control and drill in habits, but only as a resourceful and inspiring teacher can devise ways for getting pupils intelligently to think about habits and to practice them voluntarily, and on their own time. 5. Interests and appreciations, attitudes and ideals are stressed, as they should be, but as thinking outlooks on life, not as vague emotions and sentiments.

Contrary to the prevailing notion, these things are not developed by mere fact acquisition. They are mental and spiritual assets that, with most youth at least, are affected but little by direct attack, exhortation, rigid discipline or formal teaching. Some grow out of natural bents and aptitudes. Some are absorbed more or less unconsciously from the example of others. Some are inspired from contact with the enthusiasm and forcefulness of winning personalities. Most of them, however, are fixed as outlooks on life and codes of conduct by intelligent thinking about real, concrete experiences and situations. Since the attitudes and ideals of youth and citizens must constantly be adapted and applied to the changing and increasingly complex problems and conditions of a dynamic social environment, they require an understanding and resourcefulness in thinking which can only be developed by practice in thinking about many different situations and experiences.

Participating instead of pseudo or second hand experience as thinking stuff; resourcefulness in getting and selecting usable facts with which to think about real and concrete instead of imaginary or abstract problems; and practice in the application of sound thinking procedures to usable facts in order to arrive at

reliable ideas for meeting specific situations: these are the greatest needs of all youth and of every citizen in this democracy. In helping the youth to meet them, the compulsory part time school will make the best social use of much of its limited time. As it does this, it will parallel education through the Boy Scouts with a form of Boy Scout training through education.

How the Continuation School Can Do It

It is impossible to give in the limited space available here any complete or detailed statement as to exactly what the general part time school should do in carrying out the program just outlined in such general terms. The only thing that can be done is to make some suggestions as to devices and methods which have been used successfully by some part time schools and by other social agencies in dealing with the same or similar problems. In general, these problems may be stated as: giving pupils individual treatment; getting them to practice desirable habits; getting real experiences as thinking stuff; and getting pupils to think.

Giving pupils individual treatment—As has already been pointed out, any group of permit workers differs widely, as human beings, in their deficiencies and needs. Since they do not all need the same helps or most helps in equal degree, every consideration of efficiency requires that their individual assets and weaknesses be ascertained and to a large extent dealt with directly and individually—a principle universally accepted that requires no argument.

The use of the clinic—This requires a knowledge of the situations and needs of each pupil which can be gained only by the use in some form of the clinic—a device widely used in the fields of medicine and social service for getting and recording vital facts about individuals necessary before the proper treatment of a case can be prescribed. This might take the form of interviewing each pupil at the time the part time class is started so as to get some general picture at least of his standing with

regard to each of the needs or ten helps just described. It seems safe to assume that the teacher can clinic each pupil himself on each of these needs, except the second and the third on physical defects and keeping physically fit where the services of a licensed physician or a competent physical director should be used.

The clinic and its records—Experience will suggest to the resourceful teacher all sorts of facts that need to be brought out in this interview, and appropriate blanks for recording them. Out of these might come such a summary picture as is furnished on the two following clinic cards for pupils A and B.

The clinic and its graph—The entries made in these two clinic cards are given only in order to illustrate the method briefly and are not intended to be complete and detailed on any needs and helps listed. They serve to show the widely varying situations presented by typical boys and girls. By the use of plotting paper easily secured, the situation may be recorded and graphed for each pupil. This graph would furnish a permanent entrance picture of each pupil by which the teacher could readily determine at any time his most important shortcomings. When made again from a new clinic card later on, let us say, for example, at the close of his first year, this graph will also picture the progress he has made on different points, in the judgment of the teacher, and suggest again his most pressing weaknesses for treatment. This use of the graph has been found highly advantageous as an efficiency device by the agencies dealing with human beings as well as with material things, and will prove no less so for the part time teacher.

Although the graph should be made separately for each pupil and mounted separately for ready reference, the one given below pictures the ratings on both pupils in the foregoing clinic cards, so as to bring out the wide differences which a study of juvenile workers by the case method always reveals. In the graph, the rating curve for A is represented by an unbroken line and for B by a broken one. The horizontal numbers represent the corre-

CLINIC CARD

.....(A).....Compulsory Part Time Class (1924-25)
Surname Christian
name
.....Public Schools

Needs and Helps		Rating or Conditions	Program (What to do)
1. Ability to use the fundamental arts.		OK, except writing is not very legible.	
2. Physical defects.		Posture bad—eyes need attention—teeth need washing.	
3. Keeping physically fit.		OK.	
4. Getting and holding a job and planning for the future.		Does work well—thinks about future but no plan.	
5. Activities of leisure time.		Going to the movies and “loafing with the gang” and playing some baseball in summer.	
6. Love for reading.		Does not care to read even the daily paper.	
7. Interests, appreciations and hobbies.		Apparently none but the movies.	
8. Desirable social and economic habits.		Saves nothing. Spends money generously but foolishly. A little wild and reckless.	
		Fights with his gang. Profane. Boisterous.	
		Manners bad. Crude.	
		Natural gang leader—captain baseball team.	
9. Interest and initiative in social affairs.		Likes “to work out things” and “get fellows to do them.”	
		Honest and generous. Thinks “fellow should do his work right.” Believes every one has some good in him. Fellows look upon him as “square.”	
10. Desirable social attitudes and ideals.			

Possible Additional Information for Reference

- | | | |
|----------------------------------|----------------------------------|---------|
| a. Age | | e. |
| b. Last grade in regular schools | c. Present occupation | f. |
| | d. Name and address of employers | |

CLINIC CARD

.....(B).....Compulsory Part Time Class (1924-25)

Surname Christian
name

.....Public Schools

<i>Needs and Helps</i>		<i>Rating or Conditions</i>	<i>Program (What to do)</i>
1. Ability to use the fundamental arts.		Writes legibly but cannot use simple numbers in four processes nor understand fractional relations.	
2. Physical defects.		Bad posture. Eyes weak. Teeth bad.	
3. Keeping physically fit.		Anemic and present work exhausting. No recreation. Up late at night.	
4. Getting and holding a job and planning for the future.		Work unsatisfactory. Discouraged. No plan for the future.	
5. Activities of leisure time.		None.	
6. Love for reading.		Reads all the time when not at work, but only "story books."	
7. Interests, appreciation and hobbies.		None save in the stories he reads.	
8. Desirable social and economic habits.		Uses money wisely. Helps at home. Saves. Good manners and conduct.	
9. Interest and initiative in social affairs.		Apparently little. Almost a "recluse."	
10. Desirable social attitudes and ideals.		Has no leadership or following. Has little social mind. Believes world is all wrong—full of injustice and oppression. Everybody preying on everybody else. Does believe every one should give everyone else a square deal.	

For Possible Additional Information for Reference.

a. Age	c. Present occupation	e.
b. Last grade in regular schools	d. Name and address of employers	f.

sponding needs or helps on which each was rated in the clinic cards, while the vertical numbers spaced from 0 to 100 represent only comparative general standing rather than any attempt to grade or rate on the basis of 100% efficiency. As a matter of fact there is probably no individual who should be rated 100% on an absolute scale for any of these items, except possibly the fundamental arts; certainly there is no immature youth entitled to such a rating.

**Graph Showing Comparative Needs of Two Permit Workers
(A and B)**

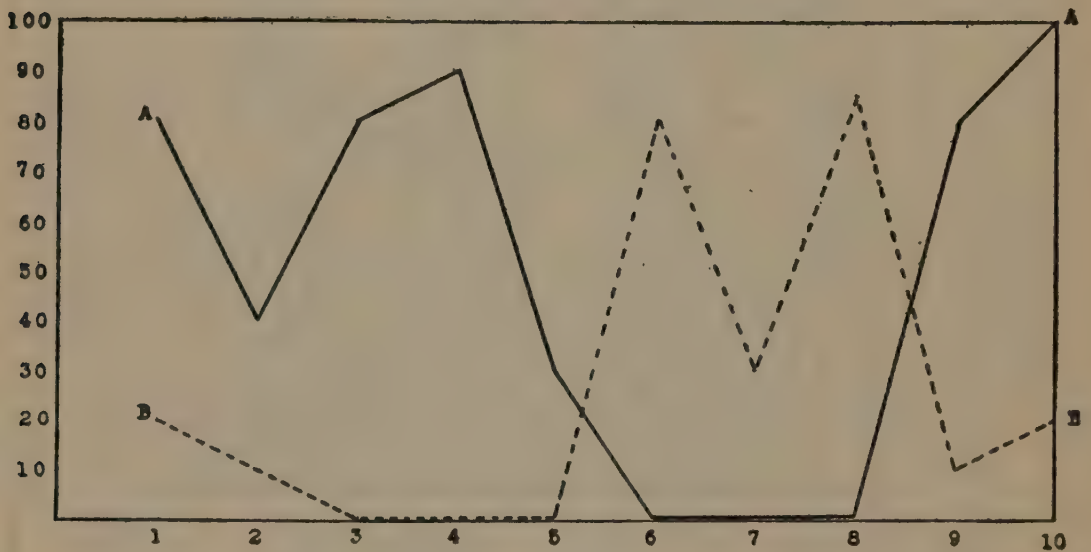


CHART No. 4

The graph shows very clearly, as does the clinic card, though not so clearly, perhaps, that in the case of A, items or helps 6, 7 and 8 need to be given special individual attention, as do 2 and 5 to a less extent, possibly. In the case of B, items 3, 4 and 5 need to be stressed personally, as do also 1, 7 and 10. All this is said, of course, with the recognition that these two pupils need all the other helps, some of which must be given personally and some through the group work of the school. With the help of clinic and graph, the teacher should at the outset of his responsibility for each pupil do three things: 1. Check up the

more important individual needs for each pupil, particularly the fundamentally important or basic needs as to health and the fundamental arts. 2. Measure the situation of each pupil against the teacher's standard as to the necessary social minima in the fundamental arts and as to the maximum in health or physical efficiency. 3. Determine the individual program of each pupil in health needs, fundamental arts needs and life needs, considering all factors in the case.

Flexible program and the rotating group—An examination of the full program of these needs and helps shows that they require, not only a flexible program in the part time class, but also the use of a variety of training or service devices by the teacher. Some of them require personal advice and follow-up by the teacher. He cannot remove physical defects, for example, but can only urge the pupil to care for them, help him to get expert service at reasonable cost; and follow up the case to see that the handicap is removed. This would also be true of "keeping physically fit." Some helps given directly by the teacher must be entirely individual, such as assisting the pupil to get and hold a job; to plan a more permanent career; and, to a large extent, to plan and carry out activities for his leisure time. Some of the deficiencies of pupils must be helped individually with little or no group treatment. Help in the simple processes of arithmetic or the mechanics of reading must be given separately unless several pupils have the same shortcomings. All pupils have needs in such things as social and economic habits, social attitudes and ideals, and personal interests, appreciations, and hobbies, which can be handled best by some sort of group and class treatment.

This combined program of personal service and individual and group instruction presents the same general problems of organization, already described in the chapter on *The Adolescent Vocational School and Its Organization*, for which the rotating group and the fixed or individual instructor are best adapted. There this device was discussed as a means of training a group of indi-

viduals pursuing individual projects in the same subject matter. Here it must be used to help pupils of the same group in different matters.

The rotating group in the country school—In a large continuation school, this problem can be met by a departmental organization of subjects and teacher so that pupils with different needs may be rotated from one teacher to another according to the helps or subjects each has been scheduled to take. Pupils deficient in the mechanics of reading, for example, go at some period to a given teacher. Another group requiring training in fundamentals of arithmetic would go at some hour to another teacher. Still another group needing corrective exercises would go at a certain time to the physical instructor. The more difficult problem is in the small part time school, of which a teacher and fifteen boys or girls furnish the simplest illustration. Here, a class in the old sense is absolutely hopeless because of the widely varying needs of pupils and of possible helps by the teacher. Breaking up the whole group into smaller groups with common needs for helps is almost as hopeless and, in reality, does not exist. A stationary teacher and the rotating pupil is the only feasible plan. This is what the one-room country school house tends to be. There pupils of all ages, abilities and grades are grouped under the same teacher. There is individual study, recitation and help in all the subjects taught. Pupils are bunched and grouped only where common things can be taught to groups made and broken, arranged and rearranged. This plan was forced upon the country school by necessity. The poor results gained by underpaid and incompetent teachers has caused a pronounced movement toward the consolidated school in order to provide more teachers and the better grouping of pupils by subjects. There can be no doubt, however, that in the hands of a competent teacher, the work of the one-room school house did develop qualities of self-reliance and industry in pupils which many ultra modern schools may well envy.

The rotating group in the continuation school—The necessity for resourceful school room management is even greater in the continuation school than in the ungraded country school. It is true that the former has greater uniformity as to age. Its pupils are defined by law, as those over 14 and usually under 16 years of age, while those of the latter usually range from children just beginning school at 6, to backward youth 16 to 17 years of age. But the continuation school has far less uniformity of subject. The country school teaches the standard subjects of reading, writing, arithmetic, geography, language, and history, while the school for the social adjustment of permit workers has no limit on the life subjects it may teach in giving its ten helps. Finally, the continuation school has no uniformity in the previous experiences of its pupils, while the country side provides the one-room school house with children having an almost homogeneous background of rural life. Like the country school, the one teacher continuation school requires two things in its procedure: 1. Primarily, the teacher deals with each pupil separately. 2. As opportunity offers, he forms groups for dealing with things of common interest or needs for the whole group, such as class singing, brushing teeth, reading to create interest and appreciation, saving money, spending money, investing money, the time clock and its ethics.

Individual instruction of the rotating group—There are three things in the part time class that can be done individually. They are the things that call for manipulative experience, for getting facts resourcefully and for thinking straight with these facts. Among the services or subjects that can be discharged by the pupil in this way are: practice in the fundamental arts of the mechanics of writing, the mechanics of reading and the mechanics of arithmetic; tool work of all kinds (manipulative experiences in the mechanical, household, agricultural and commercial arts); the use of the library and other ways of getting information, both outside and inside the school on any subject; and the prepara-

tion of material (dealing resourcefully with facts). These activities will be discussed later.

Three devices for group treatment—Three devices have come to be recognized in the group treatment of the continuation school: the conference, the class and the committee.

The conference. The conference includes the whole group. Its purpose is not to teach facts or to establish habits, but to put over ideas and ideals by organizing the experiences of the whole group and getting every member of the group to think about them. It is a pedagogical device to promote resourceful thinking based upon participating experiences and as such will be discussed more in detail later. To do this, it must pool the total experience and knowledge of the whole group, get its members to obtain more usable facts that bear upon the topic of the conference and lead its members to think soundly and resourcefully with these facts. It is a success in proportion as it gets pupils to participate in the discussion and to think freely and independently about the question at issue.

As an illustration of the many subjects or topics used for these conferences, such subjects as the following have been successfully used: Getting a job, getting along on your job, the time clock, getting a better job, being an intelligent pedestrian, what is common honesty, safety first in the shop, spending your money wisely, saving your money, investing your money, interesting things to read, what is courtesy, what are taxes and how are they raised and spent, how does a city protect its people, what is a good citizen?

The class. As a device, the class has less place in the continuation school than either individual instruction or the conference, but more than the pupils' committee. This is because it is not the business of this school to teach fact acquisition, but fact finding and fact using. Where facts are to be taught as helps to meet recognized needs, the class is a labor saving device since it teaches once what would have to be taught individually many times. To be a true labor saving device for teaching such

facts, however, the group should all need the same thing, should all have about the same degree of teachability, and have a common apperceptive basis for instruction; three requirements often stated and often violated!

Some things that can be best given in the class have already been cited. To these there can be added here all such facts, for example, as those affecting personal hygiene; simple economic facts about such things as the relation of the resources of a region to its manufacturers, the relation of capital to interest and labor to wages, the relation of money to interest, of economy to savings and savings to investments, and of both to income and protection in old age; and simple civic facts about the way in which the community gets its business done. To such a list of class activities should be added, also, the instruction of groups having the same deficiencies in any of the fundamental arts. It might be noted in passing that drills in penmanship or drawing or shop work are not class, but individual instruction.

The committee. The committee is a device for training pupils in two things. As a group working boys and girls do not, as a rule, possess much initiative in starting things and getting them accomplished. They need the opportunity to develop confidence and ability in doing this, which the committee, properly managed, will give. They also need to know how to get facts. Every opportunity should be seized for using committees to manage pupil responsibilities of every kind and to handle the social affairs of the school. Such affairs need to be fostered and encouraged as extra school activities in every possible way, as they furnish the only means available in the continuation school of training in some important phases of social education.

Pupil committees, however, will be used more largely to get facts for use by the conference. They can be employed, for example, to look up special facts in the library; or to obtain information from city officials about city affairs about which the Conference needs to know in its work; or to learn from bankers some pertinent facts about savings and investments, or from doc-

tors, something about health and sanitation. The fact that the teacher already knows or can readily obtain and furnish this information to the group tempts him to take the short cut and thus avoid the trouble of appointing and steering these pupil committees. When he yields to this temptation, he is depriving himself of one of his greatest opportunities for developing in them some resourcefulness in getting and handling facts and some initiative in human affairs. He has saved time, but robbed them of a vital educational experience.

Getting Practice in Desirable Habits

The purpose of education is to fit the individual for the performance of the social job called life. That social job is in a constant state of shift and flux with a correspondingly constant demand on the citizen for adaptation and readaptation to its changing situations. It is the business of education, therefore, to give each individual the best help possible for meeting the ever changing requirements made upon him. When fully realized, this problem presents three fundamental issues:

1. Should the chief aim of training be the equipping of the individual with facts, or resourcefulness in getting facts as needed?
2. Should the chief aim be to train his memory to retain facts, or train his thinking machine to select and use facts to meet changing conditions?
3. Should the chief aim be to teach facts about health and thrift and the like or to encourage and direct habits of conduct in actual life activities?

For each question the sound answer is the latter of the alternatives presented and for these reasons: To meet the shifting demands of his environment every citizen needs resourcefulness in getting facts more than the ability to retain any given facts themselves. Ability to select and use facts is more impor-

tant than the possession of the ability to recall a few facts. Correct habits of thinking with facts are more important than any quantity of unusable facts. All this applies with special force to the continuation school as the "last chance" of the permit worker. With its limited time, it must do the thing that will count most. These permit workers are independent adolescent wage earners and can no longer be "taught" facts in which they have no interest or see no benefit nor be "taught" habits by the imitation of others or the exhortations of authority. They are in the habit-forming stage of their lives. All admit the high necessity that every youth in this formative stage be stimulated and directed in desirable social habits. The surest way to encourage, direct and fix any habit or skill, mental or physical, is to practice it while you think about it.

Recognizing their importance, at least five different methods have been used in the attempt to direct and control the habits of the American youth:

1. *Give him a body of facts about habits* through study and recitation from books on subjects related in some way to them, such as school texts on physiology and hygiene to promote health habits.
2. *Lecture and preach to him about habits.*
3. *Hold little school room conferences about habits*, particularly about the desirability of certain general habits.
4. *Get him to practice habits* in some way as a result of class and extra school activities.
5. *Get him to practice and think habits* in some way. Do simple things at the same time he thinks about what they are, why he does them, when he should do them, how he should do them and how he can do them in a better way.

All experience goes to show that the first two of the above methods have been disappointing, to say the least, in the results gained from their use. The last three are much more effective,

for reasons set forth at various points in this book. Of them No. 5 is the best. After all, it is very largely a combination gained by the use of both Nos. 3 and 4. Neither 3 nor 4 alone get very far. Perhaps the best way to prove that No. 5 is the most effective way to establish desirable habits with the least cost of time and effort is furnished by the experiences of learners in some sport or in a new occupation. The work of the Boy Scouts is an outstanding demonstration of the soundness of the method.

While the necessity of combining practice in habits and thinking about habits is recognized in theory by many educators, the difficulty has been to secure practice in habits which the school can direct and control. Traditionally the school is isolated from life, therefore emphasis is laid on subject matter and habits of learning it rather than on the practice of social habits. Obviously, the school claims only a small portion of the time of the youth. Particularly is this true of the part time school. The only recourse is the stimulation and direction of extra school activities. These activities cannot be controlled like school room practices; rather must they be in some way suggested, encouraged and guided. This has been the more or less conscious or unconscious effort and policy of the Scout movement. Schools have long wanted to do on a wider scale for all youth, what the Scouts do for a few. What follows is suggested as a possible way for the continuation school to do this for permit workers.

If extra school activities are to be secured for part time pupils in order to secure desirable participating experiences as thinking stuff and habit making stuff, they cannot be dictated and enforced as an arbitrary school requirement. Consequently, the problem before the part time school is how to get this controlled experience by some other device than force, which will not work. This means suggestion, stimulation and direction rather than orders, and marks and punishments.

The problem of the part time school involves three kinds of

facts for training in doing and thinking: 1. A small body of previous experience common to the whole group, as children and youth; 2. Common happenings or similar situations in their wage-earning experiences; 3. A new body of participating experiences deliberately planned for and secured by stimulating the youth to undertake them and do them properly while thinking about them. While all these experiences are valuable, for the purposes of the continuation school those of No. 3 are by far the most so. This is true, however, only when this third body of experience is properly conceived, organized and put into effect.

Much more can be done than is commonly believed in the social training of young people by encouraging and directing them to do, on their own initiative, socially desirable things. Admittedly, this kind of training will require only a comparatively small portion of their total leisure time. It is the leaven in the lump, however, which promises to create wider interests, better understanding and appreciations, more intelligent thinking and improved ideals—leaven sure to react upon the regimen of their lives. In short, it should, if properly developed, build up an esprit de corps—a social morale that will act as a control element, to some extent at least, in all their activities.

A Junior Citizenship Plan—Recognizing the great need of the continuation school teacher for help in this matter, Mr. Ronald W. Kent has worked out a scheme which he calls the Junior Citizenship Plan. It is a carefully thought out device which in essence applies Boy Scout policies and pedagogy, if such it may be called, to the general part time school. The proposals of his plan may be summarized as follows:

- a. That the career of a Junior American citizen be open to every permit worker of the continuation school, but that participation in the scheme be entirely voluntary on the part of the youth.

- b. That his career as a Junior American citizen be planned for two years, which is the usual period of compulsory attendance on the general continuation school.
- c. That his career as a junior citizen mount through a series of levels or stages of citizenship.
- d. That these stages be known by some such names as: Apprentice Citizen, Journeyman Citizen and Master Citizen.
- e. That a reasonable body of desirable participating experiences which make for worthy citizenship be catalogued as requirements for junior citizens.
- f. That these requirements be distributed among the grades or stages of junior citizenship just described.
- g. That certain simple requirements be made upon the youth before he is admitted into the status of an Apprentice Citizen.
- h. That additional requirements in kind and degree be added as he advances from one stage of citizenship to another and that standards from every previous stage be maintained.
- j. That certain policies and procedures be used by the part time teacher in starting, stimulating and directing this junior citizenship under this plan.

The limited space available here prevents any exposition of this plan such as its merit would justify. It is well worth a tryout by a considerable number of men teachers who are real leaders of boys and of women teachers who are real leaders of girls. Our whole social treatment of the youth has been too much repression and negation. We have taught and preached incessantly about what not to do. The realization that this does not work has led to such movements as the Boy Scouts. Certain it is that the adolescent youth will do something. He is very likely, too often, to do the forbidden thing because this forbidden thing is not only a challenge, but seems to be the easy and attractive thing to do. Obviously, the only way to meet this

situation is not by increasing, as Society grows complex and standards of conduct rise, the number of things he shall not do, but to stimulate and direct him in the doing of some things he should do.

In general, Mr. Kent's plan, like that of the Boy Scouts, aims to improve the personal conduct of the youth by the substitution of desirable for undesirable activities, to build up through these activities, desirable interests, attitudes, appreciations, habits and ideals; and in this way to make him a more intelligent, self-determined human being. This is very well illustrated by the requirements set up for an Apprentice Citizen:

To qualify as an apprentice citizen, the working youth attending a part time school might, for example, be required, within a given period, to show that he has earned some money; that from this money he has saved at least a small amount; and that with this small amount, he has started a weekly savings account. He might show that he has paid attention to his personal appearance, meeting desirable standards as to cleanliness, and that he is carrying out certain desirable hygienic practices.

He might also show that he is obeying the school regulations; that he is prompt in his attendance upon school and work; that he cooperates in carrying out all the rules of the school; and that his work at the shop is satisfactory as evidenced by the report of his foreman.

He might show that he has read at least one book during the month; that he has corrected some fault in speech; that he is able to write his own name legibly; that he reads the daily newspaper; and that he is able to solve simple figures.

He might show that he is respectful to elders; that he is courteous in dealing with his classmates; and that, during the period, he has done at least two things to make home happier.

Finally, he might be required to show that he has selected a better job which he would like to hold; and that, with the help of the teacher and his associates, he has begun to study this job so

that he may learn what are its demands, and how he shall qualify to meet them.

It will not be possible here to discuss the merits of this plan, its feasibility, or the methods that need to be used to make it successful. These will be set forth more fully in a forthcoming book of which Mr. Kent is a joint author. It may be well, however, in closing, to point out the elements of efficiency in the scheme from the standpoint of pedagogy and of administration.

1. It appeals to the doing instinct of the youth in the habit forming period of his life.
2. It substitutes participating experiences for second-hand and pseudo experiences.
3. It provides vital thinking stuff for the conference and class work of the part time group.
4. It makes full use of the natural interests of youth and establishes an apperceptive basis of real experience for training and thinking.
5. It decreases the unit cost of instruction by increasing the time given by pupils outside of school to the training.
6. It prevents the waste of time and effort on the teaching of uninteresting material to uninterested children.
7. It prevents the waste of time and effort in teaching things which the minds of learners are not prepared to understand or to use.

Giving Pupils Resourcefulness in Getting Facts

However it may be used elsewhere, the conference method in the part time class is a device valuable only as it helps such a class to realize its objectives. The objective of the part time class, as has already been stated, is the development of habits of resourceful thinking in the problems and situations of citizenship. As has also been stated, such habits are developed only by repetitive practice in the use of functioning facts and sound thinking

procedures to meet the widest possible number and variety of situations.

This involves the following procedure repeated over and over again for different situations: A given social situation, sometimes called a problem or question, is set up; for example, the causes of accidents in shops. The objective here is to get pupils to use facts so as to arrive at sound ideas or conclusions for dealing with this situation. This involves the following steps:

1. A selection of the facts bearing on the situation.
2. A throwing of these facts up into the mind of the pupil for thinking.
3. Training in the use of these facts as thinking stuff.
4. The drawing of conclusions regarding the situation from the facts as applied to it.

The conference method as the term is used here requires, therefore, the use by the teacher of the following steps:

1. The selection of social situations, questions or problems to be thought about.
2. Getting pupils to secure the pertinent facts for each situation used.
3. Collecting and organizing these facts for thinking purposes.
4. Getting pupils to think with these facts about the situation.
5. Getting them to draw sound conclusions from this thinking.

These steps are clearly illustrated in one type of conference described in an article on Job Morale by R. W. Kent, published in the Vocational Education Magazine for May, 1924, in which the situation or problem considered was the shop or office time clock. Because specific reference is made to it here, this article is republished in the Appendix. In reading it these things will be noted: A social situation was set up at the very beginning. It was the fact that wage-earners are required to use a time clock in many employments. In this case the pertinent facts

were known to the group as a whole, and were contributed as answers to inquiries. As this conference went on, these facts were collected and organized rapidly by the questioning of the teacher. Pupils did think with the facts as is shown by the replies. The tactics used in questioning caused the pupils themselves to detect and reject the results of poor thinking and unsound conclusions. A conference may take other forms and use other devices and procedures. In essence, however, all follow the five steps enumerated and illustrated above.

The selection of social situations—The kinds of situations which should be used are illustrated by those given as topics for conference in the preceding part of this chapter. Another excellent illustration would be the question, "Why not pay workmen their wages every day?" Any social situation may be selected about which you want the youth to think. No social situation should be used merely for the purpose of fact cramming. This was done by one teacher who used for a conference the question, "How are Presidents elected?" so he could fill his pupils with all the technical facts about the electoral college and its complicated procedure. The number and variety of really usable situations are infinite.

These social situations are valuable for teaching purposes in proportion as they have the following features:

1. They are concrete and specific.
2. They are familiar in some way to all the members of the group or they can be made familiar.
3. The group collectively knows the pertinent facts about the situation or can get them with reasonable effort.
4. The situation is one that permits of the drawing of functioning conclusions.

The time clock used in his illustrative conference by Mr. Kent as just described certainly had all these features.

Getting pupils to secure facts—Some facts are already known by each pupil that bear on the situation. A considerable body

of facts is known to the group collectively. One task of the conference is to bring out or develop these facts and in this way pool them for common use in thinking. This pooled body of facts is made up of all such as the following:

1. Facts learned in previous schooling.
2. Facts gained by reading.
3. Facts learned from others in life.
4. Facts gained from the ordinary experiences of life.
5. Facts gained from the Junior Citizenship experiences.

For the purpose of training the ordinary individual in thinking about real situations, these different kinds of facts are valuable in the inverse order of the one just stated. All must be used, but reliance for effective training should be placed upon them in this inverse order. Obviously, these pooled facts known to the group do not usually, at least, furnish all the functioning facts needed to think about most social situations. The problem of the teacher, therefore, becomes this: Given a certain body of facts known to the group, how shall they (not the teacher) supply the missing facts?

Pupils should get the facts, and not the teacher, for these reasons: If the teacher supplies the facts, the pupil is deprived of one of the chief pedagogical aims of the conference method—training in the experience of getting pertinent facts for himself. Facts furnished him make comparatively little impression as compared with those he gets for himself. Participating experience in getting second-hand facts is next best to participating experience in the facts themselves.

All of us talk too much and pupils too little. Simple thinking about simple things is required, not the elaboration of all known facts or mental gymnastics in using them. This does not mean that no facts are to be supplied by the teacher. As “pusher trainer” in the conference he must always meet emergencies with illustrations and some missing facts. Even here, however, they should be contributed not as lessons, but as suggestions for the

common pool of facts developed by the group. These points are well illustrated by the way in which the conference on the time clock was handled. (See Job Morale in the Appendix.)

Devices for getting pupils to get facts—The general principles should be these: Since everybody needs training for resourcefulness in getting facts, every pupil should be drawn into a considerable number of adventures in getting facts. Since the success of the conference depends upon the participation of the whole group, every pupil should have part in it. A very vital part is the getting of facts as the working material of the conference. While some pupils are more willing or more capable than others, they should not be used to the point where this results in depriving others of interest and valuable experience.

The agencies for getting facts are chiefly and primarily the pupils themselves. These agencies differ from each other in various ways: In age, native ability, kind of previous experience, natural interest, initiative and self-reliance, kind of employment, social environment, and in opportunities and avenues for getting facts.

Among the many sources from which pupils may get facts for use by the conference are these: the family circle, the neighborhood, older friends, public officials and private citizens, and the gang, books, magazines, newspapers, bulletins and pamphlets; a well equipped school library open at night and on Saturday as well, and "looking and seeing" for themselves. Pupils should be encouraged to use all these methods as the facts needed may require, so as to get resourcefulness in attacking the problem of finding facts and in selecting the best source for different kinds of facts. The teacher should familiarize himself enough with the life of each pupil to know how to use him best as a fact gatherer.

Using pupils to get facts—This can be done in various ways according to conditions. Special assignments can be made to specific pupils utilizing varying abilities, interests and oppor-

tunities. Older and more experienced pupils can be used to head committees and do the more difficult special work as a special responsibility. Special and standing committees can be established and used for general or special search for information. The whole group can be set to making inquiries, reading books, pamphlets, newspapers, gathering opinions and the like. In the Junior Citizenship plan, one of the requirements in the advanced grades of citizenship should be that of making a report on some subject which will require some elementary "research work."

Anticipating the need for facts—Conference topics should not be sprung upon a class, but announced in advance. Sometimes these conferences may extend over a number of sessions. The kind of facts needed may shift as the conference develops and different phases of the topic are discussed. Here again the immediate subject of a conference and the kind of facts needed should be known in advance. But the greatest value of anticipating the topic is that the student will be thinking and asking about it before the group confers about it.

No teacher can succeed with this plan for getting pupils to find out usable facts for himself who dislikes the extra work and trouble involved in planning the training for them, and helping them to make the most of the experience. Without doubt, the same teacher who looks upon the Junior Citizenship scheme as "too much bother" or "too hard to do" will also continue to furnish through talk and text book, standardized subject matter in the customary way. His counterpart is the teacher who so generously tells pupils how to pronounce and spell words and what they mean because "it takes too much time and causes too much confusion in the room to have them running to the dictionary all the time to find out for themselves."

Getting Pupils to Think

It is not unfair to say that most people do little sound or resourceful thinking. They do not think because they dislike to

think. They dislike to think because they do not know how to think and because thinking is to them a painful process. They do not know how to think because they have had little, if any, practice in thinking about the real concrete facts to get ideas for meeting situations. Their memories have been appealed to tremendously but their thinking apparatus has not. Thinking is painful because, not knowing how, it is an unused, confused, unsuccessful and more or less inhibited mental activity to most of us. The continuation school cannot make profound thinkers out of permit workers, but it can give them some practice in a neglected art—if it will. There are two devices it can use for this purpose. One is the use of pupils' forms or blanks for collecting, organizing, recording and recalling pertinent facts for use in thinking about live situations, questions and problems. The other is the conference.

Forms and blanks for getting, recording and summarizing facts—In the Appendix a number of blanks are published which have been taken from *Instructional Elements for an Ungraded Course in Adjustment of Life's Activities*, published by the author, Mr. J. T. Ryan, State Supervisor of Industrial and Trade Education for Kentucky, who is, as such, in charge of the compulsory part time classes for that commonwealth. These blanks have been developed by him and used successfully, not only in Kentucky but in other states as well. (See Appendix.)

An inspection of these blanks will show the kind of simple, concrete, socially pertinent topics used. In each an objective for the work to be done has been either expressed or implied. The blanks are so drawn that they plan and make clear the kind of facts needed. They provide a systematic record of these facts. Only facts are called for that are pertinent to the topic and these facts are simple, but illustrative. Only facts are to be gathered and recorded that it is possible for pupils to get. Provision is made for the making and recording of conclusions. The forms are really boxhead devices for training in the analysis of the

topic and the facts used. They serve, also, for record and recall. Admittedly, there is danger of making such a blank a mere copy book in the hands of a mechanical teacher unable to utilize their large values for training in all the above values.

In general, the blank serves these purposes:

1. The teaching of facts by the inductive method.
2. The establishing of an inventory of facts for conference use.
3. The systematic organization of facts on paper and in the minds of the pupils.
4. A device for checking up the work of the pupils.
5. Information about the personal lives and problems of pupils.
6. The stimulation of thought about simple situations simply put.

From the standpoint of the relation of the pupil to the facts, these blanks are of a number of general types in their topics and treatment. One may be a personal record of facts about the pupil himself. Another may be a record of facts he acquires himself. Still another may be his opinions about a matter. Still another sets up questions. Still another records conference facts and conclusions.

Collating and organizing facts—It must be remembered that the whole purpose of collecting facts is not to get facts per se, but to get teaching material for use in thinking. Facts are not an end but a means. There is danger of the plan degenerating into a mere fact gathering, fact recording enterprise. Facts are of value for this plan almost entirely as they are in the minds of the group for use as thinking stuff. Getting facts, reporting facts, talking and thinking about facts, recording facts, recalling facts—all these processes have a double value: inculcating resourcefulness in collecting and selecting facts, and providing a background of facts for thinking purposes.

If the teacher has no use for any given facts, he has no right to waste precious time on them. The ultimate end of all this

work is sound thinking. This requires, among other things, training in the selection of pertinent evidence and the rejection of all other information. It also requires training in the habit of and judgment in the acceptance of correct information and the rejection of false, doubtful and pseudo information.

There is some danger also that opinions will be submitted too much for facts. The very nature of the conference calls for free discussion, and therefore will always be characterized by the offering of non-pertinent, false or unreliable evidence and unsound opinion. Much of this same thing will creep into the blanks.

This is a contingency the teacher must meet in all such way as:

1. The checking up of the pupil records.
2. The noting of the faults described above.
3. Personal or group treatment of these faults.
4. The conference method for discussing even what are pertinent facts, why they alone are valuable, why an unsound opinion is unsound.
5. When these faults occur in the progress of the conference itself, they need also to be dealt with.
6. The best method of doing this is what might be called the tactful and indirect rather than the direct attack.

Not only should the getting and collating of facts be a thinking process but their organization should be even more so. It should be remembered here again, however, that this organizing process is of value not as the teacher does it for pupils, but as pupils do it for the teacher. The blank itself is a thinking device. It is nothing more or less than a box head for analyzing and arranging facts in an orderly, systematic and logical way. It is a graphic statement or picture of the relation of facts to some larger fact and to each other. It is a tool with which to think about things. Practice in its use with a wide variety of situations and facts tends to develop the habit and skill of

using it. With many older people accustomed to think about problems carefully and resourcefully, this box-head blank is as much a tool for thinking as the free hand sketching of the engineer.

The use of the conference—Thus far we have touched upon devices and processes for securing from pupils self-activity in these phases of the thinking procedures: the setting up of situations; the search for pertinent facts about the situation; the getting, selecting and collating of missing facts and known facts. When these things have been done, the facts common to the groups and provided by the group need to be organized and talked about and thought about through the conference. It should perhaps be pointed out again that the primary aim of the conference is not the conclusion reached, although this will doubtless be sound and have undoubted social value. The main purpose and the greatest value lies in the practicing of youth to think with the use of pertinent facts which they have helped to secure and with the use of correct thinking procedures.

It will not be possible here to consider in detail the method of the conference in organizing facts, to get ideas for making conclusions. In a sense the sifting of facts to select or reject them is an organizing process in itself. This organizing of facts also takes place in the running comment of the conference leader and is illustrated in the conference on the time clock found in the Appendix. As the conference proceeds, the teacher finds opportunity for the oral and blackboard analysis and synthesis of facts, ideas and conclusions.

All that might be said, if time permitted, on the procedures of the conference could be incorporated under such heads as the following:

1. Getting pupils to keep the main problem or situation in mind.
2. Getting them to take the problem attitude. The situation in life which is presented concerns them and they need to solve it.

3. Establishing the scientific attitude that only reliable and pertinent information counts.
4. Scientific analysis of facts, ideas and conclusions.
5. Using the inductive and the deductive method.
6. Summaries and the organization of ideas.
7. The development of a thinking technique.

The Conference Leader

Admittedly, it is one of the most difficult things to tell another person either how to think, or how to teach others to think. It is much easier to tell him what they should not do than what he should do.

What he should not do—Among the things he should not do are all such as the following:

In this scheme the class cannot be conducted by the method of the recitation. The leader of the conference cannot think for the class and give them his ideas as a conclusion. He cannot think out loud with the class in the hope that the minds of the group will go along with his mind. He cannot have the thinking for the class done by himself and one or two pupils. He cannot supply all the facts to pupils in the effort to shorten the time and conform to some schedule.

He cannot use the conference as a vehicle merely for recalling and fixing facts. He cannot conduct a conference as a teacher drills a group. He cannot measure what he has done with the group either in clock hours, the number of topics he has covered in the course of a year, or in any other traditional educational way. He cannot check up the results of his work by any customary written examination.

He cannot use the conference as a vehicle for vindicating his own opinions. He cannot anticipate or bias the thinking of the class by advancing or forcing his own opinions. He cannot suppress free opinion and honestly give information even though it be erroneous and not pertinent. He cannot secure contribu-

tions from those who fear to offer them. He cannot reject contributions from group members without showing why. He cannot get participation by force. Finally, he cannot let the group run riot with sporadic uncontrolled discussion.

What he should be—The foregoing statements as to what a successful conference leader of part time youth must not do can be summarized on the positive side by some such statement as this: In this rôle he must be neither school master, debator, special pleader, judge, dictator, nor task setter. Rather should he carry into the class room conference, the same attitudes and qualities used by him in his leadership of the Junior Citizenship Plan. If he does, he and his group become friendly cooperators in the practice of thinking and search after truth. The spirit of the conference will be that of a sincere debating society without its uncontrolled wandering and its captious and technical reasoning.

QUESTIONS AND POINTS FOR DISCUSSION

1. Under what conditions, if any, should a continuation school aim at giving effective vocational education?
2. Make out a suggested program for a continuation school in a textile community.
3. What are the chief reasons that lead to the use of regular academic programs in continuation school work?
4. Discuss the relative social value of the continuation school and the full time day vocational school.
5. Would it be to the advantage of the country to raise the age of compulsory full time schooling to sixteen or seventeen, thus doing away with the continuation school entirely? Give reasons for your opinion.
6. Outline a form of organization that will enable a continuation school to deal efficiently with its objectives. Point out the difficulties in conducting such an organization.
7. In your opinion, is the continuation school a temporary compromise between the present age of release from full time school and a higher age that is to come, or is this type of school to be regarded as a permanent addition to our school program.

8. Is the passage of a compulsory continuation school law in the absence of a period of permissive legislation advisable? Why?
9. Of the three main aims of a democratic educational citizenship, general education and vocational education, which is the more important from the standpoint of the continuation school?
10. What should be the elements of a special training course for continuation school teachers?
11. Should such teachers be drawn from the group of experienced teachers already employed in the general schools? Why?
12. Make an analysis of the demands of the job of a continuation school teacher.
13. In your opinion, what is the sociological function of the continuation school? Give reasons.
14. Of the three instructing operations, imparting information, teaching by the formal lesson, and organizing experiences, which should find the greatest use in the continuation school? Why?
15. From the standpoint of the demands of a democracy, which would give the better education, a continuation school program of the type outlined in the text or the conventional high school program? Why?

BIBLIOGRAPHY

The literature with regard to the continuation school is so extensive that no attempt has been made here to cover all phases of the subject. The references given here have been selected because they represent some special phase of thinking which has a bearing on the discussions and statements contained in this chapter; in this way, the references are typical. It is needless to say that the authors, by including any article in this bibliography, have undertaken neither to indorse nor not to indorse the points of view or the discussions contained therein. The interested reader should however find in these references much that will continue the discussions as given in this chapter.

Compulsory Part Time School Attendance Laws. Federal Board for Vocational Education. Bulletin No. 55. Prepared by L. H. Carris.

A survey and analysis of the compulsory part time school attendance laws which had been enacted in the several states up to the time of the publication of the bulletin: 1920. Subsequent legislation has not been essentially different in type. This bulletin contains a very complete

descriptive digest of the legal setting under which compulsory continuation schools are operated, the provisions for the exemption of specific groups of employed minors and much other pertinent information.

Part Time Schools. A Survey of Experience in the United States and in Foreign Countries. H. B. Smith and Edith McClure-Patterson. Federal Board for Vocational Education. 460 pp. For sale by Superintendent of Documents, price 35 cents. Bulletin No. 73.

This bulletin is a very complete study of part time or continuation schools both in the United States and Abroad. Part I deals descriptively with the situation in the United States, based on a study made in some twenty-seven typical cities. Part II contains a mass of information as to the conduct of these schools in foreign countries, including England, Holland, the Scandinavian countries, Germany, France and Italy, up to the time of the publication of the bulletin (1922).

Among public documents that can be secured at a small price, this bulletin contains a mass of information as to how the job of the continuation school is being worked out in practice. It will be found to be of value to any reader who is interested in following further the discussions of this chapter or in verifying the statements made therein as to the inefficient character of these schools when measured against their social function. Sample courses of study in the appendix will be suggestive in this connection.

The State, the Child, and the Part Time School. Charles Egbert Whelan, Supreme National Lecturer, Modern Woodmen of the World. Madison, Wisconsin. Modern Woodmen Press. 68 pp.

A general presentation of the arguments for the part time school. Of interest in connection with this chapter as giving a typical presentation of the social and economic values of these schools to society and to the individual.

A further presentation along similar lines is continued in a pamphlet entitled, *A Chance for Every Child*, by Mr. Whelan, emphasizing somewhat especially the conservation of human resources as a phase of the work of the part time continuation school, as a social agent.

Both publications are of interest because they employ as a point of view the social function of the continuation school.

Part Time Schools. George C. Hambrecht. Director, Vocational Education, Wisconsin. V. E. M. Vol. I, No. 9. A discussion of the function of the continuation school from the Wisconsin point of view.

Can Intelligence Tests Help to Solve the Continuation School Classification Problem? Caroline Reedy. V. E. M. Vol. II, No. 2.

A discussion of the possible value of certain intelligence tests in connection with the grouping of continuation pupils. Interesting in connection with this chapter as showing the attitude of a certain group of educators toward the problems of the continuation school and the degree to which the methods of the regular school apply to this special type of social agent.

The Problem of the Continuation School and Its Successful Solution in Germany. R. H. and C. K. Ogden. P. S. Wing and Co., London.

Schools and the Nation. G. Kerschensteiner. The Macmillan Company, New York.

Material on 351ff. is of value here on account of the influence of the German conception of the function of the continuation school at that date, which at that time profoundly affected the thinking of educators in this country as to the function of the continuation school in the early stages of the development of the movement for such schools in this country.

A Special Report on the Needs and Possibilities of Part Time Education. Massachusetts State Board of Education. Published by the Board. 1913.

This report is valuable as a study of the casual and changing character of adolescent employment in industrial centers in Massachusetts, especially in the leading industries of that State.

Course of Study for Continuation Schools. Department of Public Instruction, Pennsylvania. 1923. Published by the Department. 142 pp.

Gives an excellent idea of the conception of the function of these schools as held at that time in Pennsylvania.

What Education Has the Most Worth? C. F. Twing. The Macmillan Company, New York.

Pages 169-177 give a point of view as to the social job of the continuation school.

U. S. Commission on National Aid to Vocational Education. Report, 1914 (House Document, 1004). Part I.

This report includes in the discussion consideration of the function of the continuation school as a social agency and the need for its encouragement by Federal aid.

Circular of Information Relating to Continuation Schools. Boston School Committee. Circular No. 26. Published by the Board. 1915.

This circular deals with the continuation schools of Boston as organized and conducted at that date. It gives a fair idea of the conception of the function of these schools as then conceived by the Boston School Authorities and by the State Department of Vocational Education. Of value historically and as showing the organization and operation of one type of continuation school which is still in operation in some parts of the country.

The following articles from the proceedings of the National Educational Association all have a bearing on the subjects discussed in this chapter as showing the development of theories and conceptions as to the function of the continuation school.

Place of the Corporation and the Continuation Schools. Proceedings, Washington, 1916. 619-21. C. E. Connelly.

Apprenticeship and the Continuation Schools of Milwaukee, Wis. Proceedings, Washington, 1914. 614-18. R. L. Cooley.

Continuation School Work in Wisconsin. The same. 1915. 308-13.

The Problem of the Continuation School. The same. 1919. 275-76.

Contributions of Part Time Education in Los Angeles. Proceedings, Washington, 1922. S. M. Dorsey. 558-60.

Recent Accomplishments in the Continuation Schools of Massachusetts. Proceedings, Washington, 1922. A. Kloss. 560-62.

Fundamental Principles of Continuation Schools (In his *Social Aspects of Education*). Irving King. The Macmillan Company, New York.

Possibilities of Part Time Education. Proceedings, Washington, 1923. 494-503. R. O. Small.

The Worker and the State. Arthur Dean. The Century Co., New York. Pages 211 on present the argument for continuation schools largely from the sociological standpoint.

Eighteenth Annual Report of the Superintendent of Schools, New York City, Department of Education. 1916-17. Continuation and Cooperative Classes. The Department, 1918.

The Vitalized School. Francis Pearson. The Macmillan Company, New York. 355 pp.

Part Time Continuation Education, N.S., Bulletin No. 34, Addresses delivered at the Detroit meeting, 1922, by C. A. Prosser, R. O. Small, Mass., Oakley Furney, New York, H. B. Smith, University of Pittsburgh, George P. Hambrecht, Wisconsin, Owen D. Evans, Penna.

This bulletin is particularly interesting because the various contributions present the point of view as to the functions of the continuation school in respective States represented by the speakers, and in the case of Dr. Prosser, his own conception as to the function of the continuation school in a national program of education.

Proceedings Fifth Annual Meeting, Cincinnati, 1911, N.S., Bulletin No. 15.

What types of continuation schools are most needed? Carroll J. Pearse.

Number of schools: Edwin J. Cooley, A. Lincoln Filene, Geo. W. Carman.

The training of factory workers through industrial education, C. A. Prosser.

Cincinnati survey of working children, Mrs. H. T. Wooley.

Should trade schools be provided at public expense, Introductory remarks by James P. Munroe; Address in affirmative by Carrol G. Pearse; Address in negative by George M. Forbes; Address in affirmative by James Wilson.

This gives a very clear idea of the arguments pro and con as they were advanced at the time of the publication of this bulletin.

CHAPTER XIV

EFFICIENCY FACTORS IN VOCATIONAL EDUCATION

All those engaged in the production of goods have learned that it is one thing to produce but quite another thing to do so at maximum efficiency. While many apparently fail to realize it, we have exactly the same thing in all education, including vocational education. It is one thing to train a person but it is quite another thing to give this training so as to secure the highest possible results from the effort.

In all production jobs some product is created by affecting or changing materials. Education also is essentially a production job in the sense that its product is an affected or changed human being. In every production job three important things are consumed, commonly called efficiency factors: The time of all workers concerned is consumed; human energy is applied and therefore consumed; and money for material, wages and overhead is expended or consumed. This is just as true of every teaching process. In the organized teaching of any thing the time and energy of both instructor and students are consumed as is the money expended for the support of the work. This applies to vocational education just as much as to any other form of the educational process.

The acid test of efficiency—The acid test of efficiency in the production game is not whether the required product or article is made, but whether it is made at minimum cost. The efficiency of performance on any job varies inversely with the amount of time, energy and money expended in its performance. If the output remains the same but the expenditure of these items in pro-

ducing it is increased, there has been a loss of efficiency. If any or all of these items are reduced, efficiency has been improved. If they remain the same, but the output is increased, the efficiency of the work has been raised. The economic world never talks about getting the job done, but always about getting it done with men, material and costs.

Every teaching project in vocational education has for its objective the improvement of the doing ability of some individual or group of individuals in some occupation or occupations. As a production job this effort should be measured as to its efficiency like any other production job. Vocational educators, like all others, need to talk less about getting the training job done somehow, and more about getting it done properly with human beings under widely varying conditions and with the best use of human effort and social resources. Any policy or procedure or instructing device which gives desired results in training for an occupation at a reduced cost in any or all of these items is an efficiency device. Any device which produces poor results in training is poor itself, and any device which produces good results at high cost is also poor or inefficient.

Fitting persons for occupations they are incapable of following is an inefficient scheme. Preparing high school boys bound for college in trades they do not expect to follow is equally so. Both are a sad waste of public money and individual effort. On the other hand, improving the technique of instruction in any occupation is an efficiency device because better teaching is sure to give better results with students, shorten the period of teaching, reduce the effort of learning, and decrease the financial cost of the work.

Special efficiency devices—After fifteen years of continuous experimenting, the leaders in vocational education are in a position to set down the policies and procedures which have proved most successful in theory and practice. They constitute devices in this field necessary to secure better results in training and econ-

omy in the use of the three efficiency or cost factors just described. A number of the more important of these special efficiency devices are enumerated and explained below:

TABLE No. 7

<i>Special Efficiency Devices</i>	<i>References to Other Chapters</i>
1. Selected groups for instruction	Chap. VIII—4, 5
2. Efficient methods of selecting groups	Chaps. V, VI, VIII—5
3. Functioning subject matter	Chap. VIII—3, 12
4. Exclusion of non-functioning subject matter	Chap. VIII—3, 12
5. Occupationally trained instructors	Chap. VIII—7, 11
6. Individual instruction	Chaps. VII, X, XI
7. Labor saving devices in training	Chap. XI
8. Use of performance tests	Chap. VIII—8, 9
9. The use of efficient teaching technique	Chap. II, XI, XII
10. Timeliness of instruction	Chaps. II, VI, VII, VIII—13
11. Individual progression or promotion	Chaps. VII, XI
12. Good personnel management of learners	Chap. VIII—14
13. Recognition of biological stages in learners	Chap. VI
14. Training on real jobs	Chaps. VI, VII, VIII—2, 10
15. Effective instructional order	Chaps. VI, VII
16. Recognition of group characteristics in learners	Chaps. VIII—14, XII
17. Training in the occupational environment	Chap. VIII—1
18. Adequate repetitive training	Chap. VIII—8
19. Observance of occupational standards	Chap. VIII—6, 7
20. Utilization of best ways for giving manipulative skill, technical knowledge, job intelligence and auxiliary information	Chap. XI

Each of these elements of efficiency in occupational training is fully treated in some other chapter or chapters of the book. They require no detailed consideration here. To assist the reader with this information, however, the numbers of these chapters are placed opposite the respective devices in the list with which each deals. Inasmuch as most of these devices are discussed in the Chapter on Present Theories in Vocational Education, the number of the appropriate theory in this chapter which applies to each device is also given when reference is made to this chapter, No. VIII.

Efficiency factors in vocational education—Of these twenty devices discussed in other parts of the book, the following statement will serve to show why they are called elements of efficiency or, if you will, efficiency factors in vocational education. Other things being equal, any scheme of instruction for any occupation will be more efficient in results and costs which selects and trains only those who need the service, want it, are willing to take it, and are able to profit by it. To do this, such a scheme must of course employ some method or policy of selection that secures such a group for instruction. Other things being equal, that scheme will be more efficient which employs an occupationally trained instructor to give real experience on real jobs in a real occupational environment. Obviously, he will succeed in his efforts far better if he uses effective teaching methods and gives all his training in such an instructional order that every step in learning leads naturally and properly to the next. Other things being equal, that scheme will produce the best results which teaches usable information to improve doing ability instead of wasting its efforts in the teaching of non-usable knowledge. This same thing can be said about the plan or scheme that gives individual instruction and recognizes individual as well as group progress in doing ability on the job. It is also true of the plan that trains its students to meet real occupational standards by subjecting their work to real performance, rather than to academic tests, and by giving adequate repetitive training to insure doing ability. Nor is this any the less true of those plans which provide timely help for workers in their difficulties and ambitions instead of formal, stated, "cold storage" knowledge. Other things being equal, any scheme will be better which recognizes and adapts its policies and objectives to the age, abilities and traits of the group it serves. Other things being equal, that scheme will be best which employs every possible approved labor saving device in teaching, such as job sheets, information sheets, charts, models, diagrams, hand books and reference books and

which utilizes all the best recognized ways to teach skill, knowledge and resourceful thinking on the job.

The application of efficiency factors to specific training ventures can be illustrated by comparing the training scheme of a manufacturing plant with that of an outside full time school, both of which have for their objective the preparation, let us say, of new recruits and learners for some occupation, such as machine shop work. This comparison, in the opinion of the writers, shows characteristic points of strength and weakness in the two schemes as they are at present organized and conducted for any occupation. These are presented graphically in the following chart.

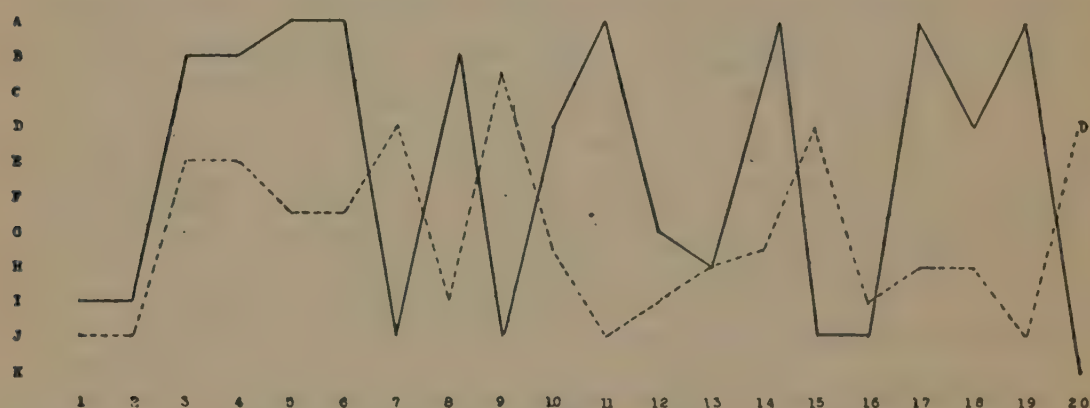


CHART No. 5

Comparing Plant and Outside School as Training Agencies

In it, the numbers arranged horizontally across the bottom represent the corresponding numbers of the special devices listed and explained in the last preceding table. The letters arranged vertically down the left of the chart represent comparative efficiency in the use of these devices, A representing high, and K very low, efficiency. For the work of the plant an unbroken curved line is used and for the outside school a broken or dotted one.

We have had no particular plant in mind and no particular school, but only some typical plant which does give systematic instruction to beginners and some school whose controlling pur-

pose is to prepare adolescents for employment. The ratings made are entirely impersonal. Furthermore the plant may or may not operate a school to supplement the shop training of novices and learners. We do not believe that the question of whether it does or does not affects our ratings very much one way or another.

It must be understood once more that the statements made through this graph represent only the opinions of the writers. If the 20 points of comparison be accepted as sound tests of efficiency, then the only point of difference, if any, with any reader, would be the place or rating given the two schemes on these points. At any rate a study of the graph will be profitable even if he differs from its conclusions. Such a study will at least raise most pertinent, and possibly in some cases embarrassing, questions as to what is real occupational training and as to how it can be secured by plant or outside school.

What the diagram says—What we have said in the diagram are these things: When the plant does undertake to train any group of employees, it will usually be strong in everything that furthers production because that is its job, while the outside school will be strong in teaching because that is its job. Consequently, we find the plant ranking above the school in the selection of workers for training and in methods of selecting them. The plant tends to choose workers for fitness while the school tends in a generous spirit to admit all who apply. For the same reason plant training rates above the school in the directness and usability of what it teaches. Because it is primarily interested in doing ability, the company is much more likely than the school system to use as an instructor a workman who is a master of the occupation; to train on the real job and in the working environment; to give timely help for meeting immediate demands; to instruct workers individually more than by groups; to measure their progress by performance tests; and to advance them as individuals not as student groups. For the same reasons, employers' schemes are sure to have for their objective the preparation of

employees to meet occupational standards, and to give the repetitive experiences in operations which these standards demand. The advantage in the personnel management of the morale of the learner is with the plant rather than the school because it has wage control over him in a real, not a pseudo environment.

On the other hand, the outside school is almost always superior in the teaching methods employed by its instructors; in the organization of teaching material for both shop and class; in the better arrangement or ordering of processes and jobs as progressive steps in learning; in the use of labor saving devices in instruction; in the better recognition and understanding of group characteristics, particularly of the abilities and traits of adolescents; and in resourceful ways of teaching skill and knowledge and thinking. Finally, it will be noticed that no distribution is made in the rating on point No. 13 as between the two agencies. We have ranked them equally as to their recognition of biological stages in learners because there is something to be said on both sides of the question. While the school is on the whole probably more sympathetic with the adolescent and his problems, the plant is much more insistent upon training him thoroughly in occupational habits, at this, the habit forming stage in his physical and mental development.

Efficiency of the two schemes—Accepting the chart as sound, organized plant instruction ranks high on fourteen of these twenty points of efficiency and the school on five, while both rate about alike on one. The purpose of the chart, however, is not to make invidious comparisons between the two types of training agencies, but rather to bring out sharply the tendencies toward strength and weakness in the use each makes of recognized efficiency devices for the instruction of workers. Nor is there any intent in the chart to rate them against any standard in which A represents 100% or perfection in performance, and K represents zero. From the standpoint of effective training, there is great need and wide opportunity for improvement by each agency on each of

these efficiency points. For the purposes of this discussion, however, we can consider the horizontal line between F and G as separating the rankings so as to give us above the line those devices in which an agency tends to be stronger and below the line those in which it tends to be weaker. This would give us the following table.

What the table says—An inspection of column I of this table will show what has already been pointed out, that the plant tends to be strong on those efficiency devices which further the production of goods; which are, therefore, devices to which it has long been accustomed; and which lend themselves most readily to the customary organization and practices of the shop. On the other hand, the efficiency points in which the plan needs strengthening are all school or pedagogical devices with which the plant is not familiar in its production work. The school tends to be efficient on these points which have to do with teaching and with which schools and school men are therefore much more familiar (3). Where they need strengthening most is in the use of what might be called performance or doing devices very common to the shop, but entirely foreign to the theories and practices of the traditional schools (4). Both are weak and need strengthening on the personal or human side of all their dealings with learners.

The basis of judgments—It would be impossible, within the necessary limits of this discussion, to present the various considerations that have entered into the judgments expressed in the foregoing tables and charts as to the present tendencies in the efforts of plants and schools to train for doing ability in occupations. It would be more so to state the causes lying back of the strength and the weakness of each of those training agencies in their use of recognized efficiency devices. It would be still more difficult to point out all the things that each needs to do in order to improve its training service. The principles supporting all the suggestions that might be made, if space permitted, are fully set forth in various chapters of this book. The reader

TABLE No. 8
Showing Tendencies of Agencies in Use of Efficiency Devices

PLANT		SCHOOL		PLANT AND SCHOOL
<i>Tends to be Strong in</i>		<i>Tends to be Strong in</i>		<i>Need Strengthening in</i>
3. Functioning subject matter	7. Labor saving devices in teaching	3. Functioning subject matter	5. Occupationally trained instructor	1. Selection of groups
				2. Selective methods
4. Extension of non-functioning subject matter...	9. Efficient teaching technique	4. Exclusion of non-functioning subject matter	6. Individual instruction	12. Personnel management of learners
5. Occupationally trained instructors		7. Labor saving of in teaching of		13. Recognition of biological stage in learners
6. Individual instruction ...	15. Effective instructional order	9. Efficient teaching technique	8. Use of performance tests	16. Recognition of group characteristics
8. Use of performance tests.		15. Effective instructional order		
10. Timeliness of instruction.	20. Utilization of best ways to teach skill and tech. knowledge	20. Utilization of best pedagogical ways of teaching manipulative ability and related knowledge	10. Timeliness of instruction	
11. Individual progression...				11. Individual progression
14. Training in the real job.	20. Utilization of best ways to teach skill and tech. knowledge		14. Training on the real job	
17. Training in occupational environment				17. Training in occupational environment
18. Adequate repetitive training	20. Utilization of best ways to teach skill and tech. knowledge		18. Adequate repetitive training	
19. Observance of occupational standards				19. Observance of occupational standards

can readily refer to them by consulting the table on Special Efficiency Devices in this chapter.

Summary—Perhaps the whole situation can be summarized fairly in this way: In the training of its employees, the plant needs to become not less a production enterprise on the doing side but more like a school on the teaching side of this service. The school, on the other hand, needs to become not less a systematic agency on the pedagogical side but more like a shop on the practical side of all instruction. Here each can learn and readapt some things from the other. On the personal or human side of service to the learner, also, each has a little to learn from the other. Both, however, have very much to learn about selecting and grouping individuals for training in employment; about adapting instruction to the age and ability and previous experience of learners; about managing young people of different races and traits and points of view; about capitalizing their interests and aptitudes; and about developing their personal and job morale. In all these matters, we shall make progress on the whole only as employers conserve their learners more and the schools coddle theirs less. The plant needs to think more about young wage earners as human mechanisms to be improved and the school more about students as economic assets to be equipped for doing.

QUESTIONS AND POINTS FOR DISCUSSION

1. Taking the twenty separate Efficiency Devices as given in this chapter, set up, in two parallel columns, the conditions that make it necessary to:
 - a. Fully meet these factors in a vocational school.
 - b. Make it less necessary to meet these same factors in a general school.
2. Where subjects are taught for appreciation, such as history or art, would these efficiency factors apply? Why?
3. For which subjects, as taught in the curricula of the average high school, should these special efficiency factors apply?

- | | |
|---------------------|------------------------------|
| a. Geometry. | g. Physics. |
| b. Algebra. | h. Civics. |
| c. Ancient history. | i. United States history. |
| d. Latin. | j. Botany. |
| e. French. | k. English literature. |
| f. Chemistry. | l. Rhetoric and composition. |

Give reasons for your answers.

4. Is it or is it not desirable, from the standpoint of social values, that attendance at high schools should be limited to those who can meet the tests used for grading and promotion? Does the same principle apply to the vocational school? Why?
5. What would be your reaction to the following statement: "A vocational education course is a good thing for any boy: it gives him a chance to find out something about how the work of an occupation is conducted." Give reasons for your position.
6. Should the special efficiency factors stated in this chapter be applied to the teaching of manual training? Why?
7. Why is it more difficult to apply these efficiency factors in the teaching of home making and agriculture than in the teaching of commercial work or of trade and industrial work? Can they be applied if one is willing to take enough trouble? In view of the social objectives should they be applied? Why?
8. Has a public school any right to deny admittance to any applicant? If so, on what grounds? What should be the grounds for refusing admittance to a high school? Should the same grounds form the basis of admittance to a vocational school?
9. List out the reasons why it is socially undesirable for a vocational school to be made a dumping ground for mentally deficient boys and girls, if that sort of training is the best training that can be given to develop their mentality to its maximum possibilities?
10. Secure descriptive material as to the organization of some vocational school. Rate the efficiency of this school against the list of special efficiency factors given in this chapter, as indicated by the following:
 - a. Conditions of admission.
 - b. Separate classes for "T" work (Richard's formula) for the different occupations taught.
 - c. Method of rating and promoting.
 - d. Character of shop training.
 - e. Qualifications of teachers.
 - f. Conditions of graduation.

- g. Specific and functioning character of the content of the different occupational training courses.
 - h. Methods used for securing the content.
 - i. Such other points as you think have significance.
11. Two vocational schools, A and B, have the following characteristics. Which would you rate as the more efficient? Why?

SCHOOL A

Admits in September and February.
 Admits on graduation from the elementary schools of the city.
 Teaches shop mathematics to mixed groups.
 Teachers are graduates of normal schools who have had some practical training as a part of their normal school experience.
 Shop training by exercises or pseudo jobs.
 Director an ex-grammar school principal.
 All courses based on text book work.
 No advisory committee and no cooperative relations with either the workers' organizations or those of employers.
 A marking system based on a percentage basis.
 Promotion determined by standing in that marking basis as to non-shop work only.
 All work organized on a class basis.

SCHOOL B

Admits at any time.
 Admits on minimum age only without regard to academic standing in the school previously attended.
 Admits on basis of demonstrated mechanical ability as shown by results of tests for such ability.
 Teachers are drawn from the occupations taught, many of whom never went beyond the grammar school, but who are master workers.
 Promotion determined solely on performance tests in the shop work.
 No regular class work in "T". This is given in the shop as occasion demands.
 The entire vocational part of the program taught by trade trained teachers.
 In making this rating take each of the efficiency factors in turn and give them a value on a scale of ten for both schools.
 The results can be plotted as a curve, if desired, in order to get a graphic comparison.

BIBLIOGRAPHY

New Methods in Teaching Vocational Agriculture. G. A. Schmidt. The Century Co., New York.

Gives an application of most of the efficiency factors discussed in this chapter to the teaching of agriculture. Particularly does it stress methods of instruction giving particular emphasis to the newer problems, such as those of farm shop work, of part time and evening work, of junior project work, and of supplementary farm practice work.

The Man, the Instructor and the Job. Charles R. Allen. J. B. Lippincott Company, Philadelphia.

Deals with the application of most of the efficiency factors discussed in this chapter to the teaching of industrial occupation work with special emphasis upon the conditions and methods necessary for effective class and shop instruction.

Day Schools for Young Workers. F. J. Keller. The Century Co., New York.

Deals in a comprehensive way with the devices and methods found efficient in part time and continuation schools.

Annual Reports of Federal Board for Vocational Education. 1918 to 1924 inclusive. Government Printing Office, or the Board.

Running through these reports are numerous brief discussions of the factors that make for efficient vocational education in all fields.

Report of the Commission on National Aid to Vocational Education. 1914. Government Printing Office.

Chapter III contains a description of the characteristics and use of day, part time and evening vocational schools and classes. In the Appendix, a brief description is given of the Apprenticeship systems in certain Labor Unions. There is also an excellent analysis of the replies received from employers to a special questionnaire, showing the typical situations as to training in 1914 and their attitudes toward vocational training and Federal aid.

The Vocational Magazine. 1923 and 1924. J. B. Lippincott Company, Philadelphia.

Published 10 times each year. Every number contains discussions bearing on the efficiency factors discussed in this chapter and suggestions as to ways for realizing them.

Vocational Education. David Snedden. The Macmillan Company, New York.

Presents the economic, social and pedagogical theories lying back of the efficiency factors considered in this chapter.

Part Time Education. Harry B. Smith. Bulletin No. 73 of the Federal Board for Vocational Education. Government Printing Office.

Discusses the efficiency factors for trade extension education, the difficulties to be met and ways for meeting them. Also gives an extensive list of part time schools with brief descriptions of some of them.

Bulletins of the Federal Board for Vocational Education. Government Printing Office.

The following bulletins deal with special efficiency factors in vocational training: Nos. 36, 37, 52, 54, 58, 60, 71, 78, 82, 89, 92, 95.

CHAPTER XV

GETTING THE JOB DONE

There are only three ways of getting vocational education: through the isolated school alone; through the job alone; and through some combination of school and job. The first agency has also been aptly called the non-cooperating or traditional all day school; the second, the non-cooperation occupation; and the third, the cooperating school and job. The all day school has been fully discussed in previous chapters. It remains here to take up the problems of training workers from the standpoint of the occupations and to consider the ways in which they have gone at the task.

Primarily, this chapter will discuss trade and industrial education because most of the training in employments has been given by manufacturing plants alone, or by some combination between the plant and the school which may be public, privately endowed or conducted by the business itself. The tremendous progress of the present century in the standardization of trade and industry has forced a greater consideration than in other fields of the need for efficiency and ways to obtain it. In its rapid adaptations and developments, industry has not been hampered by traditions nor by previously organized academic efforts, so much as other lines. Consequently, most of the schemes in which employers play a part have been worked out in trade and industrial training. When these have been presented, certain analogies will be given in this chapter between situations in industrial education and those found in agricultural, commercial and home making.

As stated above, there are in general two situations presented

by current efforts to train persons already employed. One includes all the schemes carried on by non-cooperating employers or employees or both. In practice very few are conducted by employees alone. This might be called a self-contained shop. Perhaps the best illustration of this is furnished by any well regulated shop in which the foreman undertakes to instruct, in a systematic way, new recruits while they work at the job.

The second includes all those schemes conducted by cooperating schools and employers or employees or both, which may all be styled cooperating schemes. All the training done under the Schneider or Cincinnati plan, in which the worker divides his time equally between school and shop, is of this type. So are all part time and evening trade extension classes. Here also should be listed the correspondence instruction for compositors maintained by the International Typographical Union. In the very nature of the problem most of these schemes are controlled and operated by employers who, as such, have command of the time of workers.

As a workman makes his way into any line of employment, he passes through three periods in his career. As a new recruit he is inducted or broken into a new job. As a wage-earning learner he advances to full competency as measured by minimum shop standards on this job. Finally, as a qualified employed worker, he wants a better job or wants to do a better job. These three periods or phases in his working life may well be called induction, learning, and pursuit or extension. If his needs were met as they should be at every stage of his working career, there would be provided for him training for induction into the work as a new recruit, training as a continuous learner on the job and training for advancement as a qualified employed workman. The general characteristics and conditions of these three training periods are shown in the following chart.

It is understood, of course, that the chart given below generalizes roughly and broadly many infinitely varied situations.

TABLE No. 9
Characteristics of Three Stages of Learning

	Induction	Learning	Extension
1. Stages of progress	Vestibule	Part time	Evening or correspondence
2. Stages in training	New recruit	Wage earning learner	Qualified employed worker
3. Standing of workers	Loss	Break even	Profit
4. Economic results to employer	Environment habits	Manipulation habits	Thinking habits
5. Habits stressed	Wants a job	Has a job	Wants a better job or wants to do a better job
6. Attitude			
7. Age	16-18	18-20	20-30
8. Biological age	Adolescent	Youth	Adult
9. Time allotment	Usually 1-6 months	Usually 1-4 months	Indefinite (none)

Usually, employers, for example, consider new recruits an economic loss during the breaking-in period. This is not always true. As has already been shown in the chapter on the Economic Theory of Vocational Education, the proper training of new recruits operates to shorten this period of loss, while the systematic instruction of employed learners brings them more rapidly to the stage of qualified workers, earning a larger wage for themselves and a profit on their services to the employer. In its very nature, proper training would inculcate at every stage all efficient habits, but the greater emphasis of the new recruit is undoubtedly laid on adjusting himself to the environment of the job. With the learner, it is placed more on the development of skills and speed in his work. The qualified workman, secure in his ability to meet manipulative requirements of his task, tends to think more about his experiences, the improvement of workmanship and getting ahead in the business.

The time allotment for the three stages in a shop career obviously will vary greatly according to the kind of occupation, the standards and policies of the management, and the native ability and aptitudes of the worker. Consequently the phrases "one to six months," "one to four months," and "indefinite or none" are only attempts to state broadly and roughly general tendencies in shop policies. Obviously, most new recruits who failed by the end of six months to adjust themselves by rough standards to a job would be dropped. Learners who failed to make at least minimum progress in four months are usually checked out. The improvement and advancement of the qualified worker through evening or correspondence instruction is entirely a voluntary matter and not subject to any regulation whatever in most shops.

The vestibule stage in training is in the majority of shops still more honored in the breach than in the observance, so far as systematic instruction is concerned. Nevertheless, in all industrial concerns at least some little instruction, direction, sugges-

tion, help—call it what you will—is given to all new recruits. The path of progress lies in more attention to organized instruction about their jobs, from tests and processes to safety precautions, and about the regulations, customs and policies of the shop. The situation varies all the way from almost perfunctory employment at an unexplained, undemonstrated task to the finest type of vestibule training. Most frequently this is done through a competent foreman or assistant foreman.

Sometimes a special day is set aside in the shop for this vestibule training, and to it new recruits are sent and kept until they are ready to go out on the regular shop floor as advanced learners. Usually the company pays the new recruit a nominal wage during this breaking-in period. During the war both the national government and the great essential war industries established vestibule schools on a large scale for the rapid preparation of novices for specialized tasks. All these are illustrations of the way in which the isolated or self-contained shop tries to handle the problem. On the other hand, one endowed school is now operating a cooperative vestibule scheme in which a peripatetic instructor in molding gives training to new recruits and learners on the shop floor of some twenty-seven different shops.

Part time training is usually a cooperative scheme in which some school outside the plant gives training for from four hours to half the working time to learners. As the emphasis in these classes is usually laid on related technical knowledge, leaving the shop to teach manipulative habits, they are seldom used for new recruits who are usually first broken in by the shop and then sent to the school. Illustrations of this arrangement are furnished by all the voluntary and compulsory part time classes conducted by public or endowed schools. There are also a considerable number of non-cooperative schemes of this kind where the classes are controlled and supported by the plant. Notable among these are the vestibule school for orphans and poor boys, and the school for apprentices at the Highland Park Plant of the Ford Automobile Company in Detroit. Most evening exten-

sion classes for adult workers are conducted by public or endowed schools, though a considerable number of plants also maintain their own schools for their employees, outstanding examples of which are the evening schools of the Westinghouse and Bethlehem Steel Companies.

Since the evening school has already been fully discussed, it needs no further consideration here, except to point out again that only in some lines do facilities permit training in machines and processes in the public and endowed schools because of their limited equipment, which is usually confined to the trades of the traditional day school in which these evening school classes are also held. There is no reason to prevent industrial plants from using their equipment at night during slack seasons, at least for this purpose. A few endowed schools have made considerable progress in the use of commercial equipment by sending instructors to commercial shops for training evening groups. On the whole, however, the evening extension school gives technical knowledge as directly related instruction rather than manipulative practice.

“Beating the pick up method”—The waste and injustice of leaving workers to learn by their own devices has already been shown in preceding chapters. Realization of this brought National and State subsidy to the vocational education movement. It has also caused many progressive employers and associations of employers to undertake a wide variety of schemes for the more systematic instruction of their employees. These experiments and movements are still very young. Some of them are very much on trial. Like the industrial and trade schools, many of them have disturbing weaknesses in one way or another. Some most excellent work has been done. As with the schools, there is still great room for improvement. The important thing is that promising beginnings have been made and that experiments are being earnestly conducted and interpreted.

Out of all these ventures, the lineaments of a system of industrial education, that is not but is to be, are beginning to appear.

When it comes it will be a cooperative, not an isolated plan, wherein school and shop will each find its definite field of service. In the following table a list is given in the first column of most of the recognized ways for helping a worker break in, learn, and advance in, an industrial employment. For purpose of comparison these ways are made to include not only the conscious training schemes of industry, but the pick up method and the isolated self-contained day school as well.

TABLE No. 10

Devices for Getting the Training Job Done and Their Efficiency Rating

1 <i>Training Schemes</i>	2		3		4	
	<i>Induction</i>		<i>Learning</i>		<i>Pursuit</i>	
	<i>Theo.</i>	<i>Act'l</i>	<i>T</i>	<i>A</i>	<i>T</i>	<i>A</i>
1. Worker does it all by pick up...	F	E	F	E	F	E
2. Worker does it all by pick up and correspondence schools	D	E	D	D	B	C
3. Outside day school does it all...	A	C	A	C	—	—
4. Evening school does it all.....	—	—	—	—	A	B
5. The part time extension school does it all	C	D	A	B	—	—
6. Foreman does it all (no school)..	A	C	A	B	A	E
7. Foreman instructor does it all (no school)	A	B	A	B	—	—
8. The visiting service man does it all	A	B	A	B	—	—
9. Plant does it all with its own school	A	C	A	B	A	B
10. Local association does it all (no school)	D	E	D	E	D	E
11. Local association and outside school do it all.....	A	C	A	C	A	B
12. National association does it all (with its own school).....	A	B	A	B	—	—
13. National association and outside school do it all.....	A	C	A	B	—	—
14. Union does it all (with its own school)	B	D	B	D	A	C
15. Pure informational service does it all	E	D	C	D	B	D

In the foregoing table, most of the training schemes listed in the first column need no further illustration at this point. This

is certainly true of the first five. Schemes 6, 7 and 8 provide training on the job by the regular production foreman, by an assistant employed for the purpose, or by an instructor, usually furnished by an outside school who acts in the capacity of an assistant to the production foreman, and is subject to his direction, while instructing. The first of these is a very common practice, but the last arrangement is admittedly exceptional. Item 9 lists all self-contained plants which do all their own training in the shops and in company schools such as those of the telephone companies, the General Electric and the Western Electric Companies. Schemes 10 to 13, inclusive, are variations in the efforts of associations of employers to "beat the pick up game."

The first of these represents the attempts of local associations of employers to have their members carry on some systematic instruction of workers, and to get workers interested in what is called self-improvement. Next to the pick up method, this is the weakest of all the plans. It is the pick up method glossed over with talk and seldom gets anywhere. In some cities local associations of employers in the same or kindred lines from time to time organize themselves to conduct either a vestibule or training school. Notable among these ventures are those recently established in some of the larger cities by contractors in the building trades.

A few national associations have established a national school or schools to which promising young men or women are sent. Sometimes, these schools are supported by the Association and sometimes privately endowed schools are approved as national training centers. Notable among these are the National School of the United Typothetæ of America and the three approved schools of printing conducted by Dunwoody Institute at Minneapolis, Carnegie Institute at Pittsburgh, and Wentworth Institute at Boston. Some national associations rely entirely upon outside schools for the training service. Dunwoody, for example,

is the officially designated school for the National Retail Bakers' Association, but state and local associations everywhere encourage the establishment, under any auspices, of state or local training for this business. The National Association of Plumbers and Steamfitters is now endeavoring to have local associations, everywhere, establish cooperative schemes with local public or privately endowed schools.

It should be pointed out that, in general, these national schools are for a limited number of more or less selected young people. They do excellent work, but the scheme offers no solution of the mass problem of inducting and training novices on a large scale. Perhaps the largest value of these national schools lies in their pioneer character as experiments in the discovery and development of effective courses and methods of instruction. There are few union schools in existence, except a very small number of correspondence training schools such as was cited in the case of the Typographical Union. Occasionally an emergency arises which the union meets by special training, usually in the lodge hall. When recently, for example, a trade controversy arose as to whether carpenters or sheet metal workers should install metal inside trim—a new departure in building construction—the carpenters' union in many centers set up special evening and dull season classes for teaching its members how to do this work.

Only recently, also, a local typographical union sent many of its compositors to the evening school of an endowed institution so that they might learn linotype operations, the traditional plan of permitting them to practice on idle machines in newspaper offices having been discontinued. Finally, item No. 15 means nothing more than furnishing workers through bulletins, pamphlets, catalogues and such trade journals as they may take, information of a more or less general highly technical or discursive character about the business.

In the table, columns 2, 3 and 4 represent the three learning and training stages already termed induction, learning, and pur-

suit or extension. Each of those columns is subdivided into two sub-columns marked T (Theoretical efficiency) and A (actual efficiency). Under T and A down the column we have attempted to represent our judgment as to the comparative efficiency, theoretical and actual, of the corresponding item or training schemes listed in column No. 1. For this purpose we have used in the descending order letters of the alphabet from A to F, beginning with A. Taking item No. 1 where the worker does all his own training by the pick up method, we have said that theoretically the efficiency of this method during the inductive period was F, the lowest of all, but actually about this scheme in many instances it might rise to E. We have given about the same judgment for the learning and pursuit periods. In setting down these comparative ratings on the fifteen schemes of training listed, the letters used represent the general convictions, "by and large" of the writers as to the merits of the different plans under general conditions. The judgments expressed are doubtless open to challenge because of some examples to the contrary. They represent, however, our sincere belief as to the general situation based upon observation and experience as well as upon theory.

It may be well to call attention to a number of matters in the chart. No attempt has been made to rate the training of the adolescent Day School (item 3) during the pursuit or mature worker period, because this school is not for adults or for evening time. This is equally true of the part time extension school. Similarly, the evening school is not rated for the induction and learning periods of the youth. Since the schools of National Associations provide only day training for promising young people, they are not rated as a device for adults. Foremen are rated as trainers for all three periods, but assistant foremen (item 7) and the visiting service instructor (item 8) are rated only for the induction and learning periods because they are seldom used for the further instruction of qualified workers.

In arriving at the ratings on the Chart, a number of things

had to be taken into consideration as the basis of our markings. All these schemes differ greatly as to the degree of actual control over the training. None at all exists in the pick up method which is learned by chance, while the all day school with its school shop and the foreman instructor exercise a very high degree of control over the whole learning process. On the other hand, the part time extension school has little if anything to say about what is taught in the shop or how it is given. They also vary widely as to the kind and degree of participating experiences. Those of the day school at the best tend to be pseudo, while those on the commercial shop floor are very real in every way.

The occupational environment of shop training tends from the start to develop the environment habits the youth must acquire before he is really inducted into the job. They cannot be picked up from informational sheets or correspondence text books. Too often when acquired in a school they have to be unlearned on the job and the required ones taken on later in their place. On the whole, shop foremen and their training assistants are much more likely to be occupationally competent than school instructors, but not so versed in resourceful teaching devices. Finally, some of these schemes are much more complete in their provisions and service than others. The plant with its own school ranks high for each period in this respect. So does the National Association School for the new recruit and learner.

This can seldom, if ever, be true of the Union School or a local association of employers without any school, while a foreman or an instructor foreman is almost helpless, under the given conditions, when they undertake the technical improvement of mature workers without the aid of some form of school. All such considerations as the foregoing applied to the previous schemes gave as a composite conclusion the markings at which we arrived.

It will not be possible to discuss or defend these ratings in detail. The reader, of course, will form his own judgments and

the table is worth careful study for this purpose. Such a study will undoubtedly bring to his attention many considerations as to what constitutes real training for a job and real efficiency in training people for work. All that can be done here is to give a brief interpretation of what might be called certain high points in the ratings. Through them we have said that, laying entirely aside the question of mass training, the best way theoretically and practically to induct a new recruit into a job is by organized training on that job given by a competent foreman or his assistant, or by a national school for this purpose; that next in order are the public and private all day schools; that this task is not the one for which the part time extension school is best fitted; and that, of course, the pick up method always is the worst of all schemes.

For the period of learning, the job instructor scheme and the national school schemes rank at the top. With them are placed, for this period, the plant school and the trade extension school now that the recruit has been broken into his job by the shop. After these comes the all day school preparing pre-wage earners for advanced entrance into the occupation. Still at the bottom of the list stands the pick up method with or without correspondence school help, since the latter serves best for the qualified workman seeking promotion.

Naturally, the evening school stands at the top of all schemes for helping adult workers earn better wages or get better jobs, and this, whether it is an isolated evening school conducted in cooperation with local associations of employers or of employees. If distinguishing between these types of evening schools, we should be inclined to place the plant school at the bottom of the list. We would do this because too many plant schools give highly technical general courses that are over the heads of discouraged students and do not furnish functioning knowledge in usable form, either for their work or their ambitions.

Union schools to meet emergencies are attended by their mem-

bers for pressing economic motives. They are listed next in order, but are recognized as exceptional and temporary devices. With them are bracketed the worker who has in some way, by the pick up method, become a qualified worker and a correspondence school student. The next rating is that of pure informational service (from books, trade journals, etc.) gained by earnest students. At the bottom of the list stands the ever present pick up method, the futile efforts of foremen to give their men extension training in technical subjects on the job, and without the aid of any form of school; and the equally useless attempts of local associations to "buck up" their men to do something without providing any way to do it.

It cannot be too strongly emphasized again that these ratings are general and based upon convictions, arrived at as described, but with full recognition that, in any given case, the actual rating may be better or worse, according to the occupation, the local conditions, the kind of shop and school leadership available, the way in which the plan is organized and conducted and the community psychology under which it must be conducted.

Suppose we take as an illustration the training of an auto repair mechanic. At the present time there is no national association which either conducts or uses any approved school for recruits, learners, or qualified mechanics in this business; nor is there any national association specially interested, as an organization, in training for the business. Furthermore, there is little likelihood that there ever will be. Consequently, the preparation of new recruits and the instruction of learners will probably always be a local matter.

At present auto repair work is carried on by a great number of small shops. There are no large plants for this service comparable to those found in so many other lines of production or of service. Hence, there are no plant schools and will not be, at least until sweeping changes in conditions bring, if they ever do, a reduction in the number of makes of cars and the consoli-

dation of sales and repair service into the hands of a few concerns in a community. Local associations of dealers or garage owners have nowhere established their own schools and thus far have shown little realization of the need for any systematic instruction of workers. They have given little encouragement to the training efforts of auto departments in all day schools. Part time classes are conspicuous by their absence. The larger repair shops are maintained by dealers in cars, fierce competition between whom operates to discourage and inhibit cooperative action except in such obvious things as the maintenance of good roads and the improvement of safety regulations for drivers. Apparently, the common benefit of better mechanics has not yet been placed in this category.

There are few occupations where the pick up method of learning is so universal and so costly. Car owners complain bitterly about the service they get on their cars from most garages, but no constructive steps have been taken by the trade to remedy the trouble, the greatest of which is the ignorance and carelessness of workmen. Correspondence instruction offers but little help to new recruits and learners but can do much for the capable and qualified worker. Local associations do talk at times about the need for better workmanship in the repair shop, but most of this is only sounding brass and tinkling cymbals. Under these conditions, national schools, plant schools, local association schools, union schools and correspondence schools are not feasible devices, nor does the information service furnished by the makers of different cars furnish any solution.

Faced by such a situation, we believe that a director of vocational education in any local community should adopt these policies:

1. Sell the local association on the all day preparatory course in auto mechanics.
2. Determine the point of advantageous entrance into the repair shop of the school trained boy whether this be, for example,

at the end of three months, six months, or two years of training.

3. Get the members of this association to agree that they will use these boys as the source of supply for new workers.
4. Train the foremen of auto repair shops to be effective instructors in repair processes of new recruits and learners, particularly the latter.
5. Work for the establishment of part time extension classes for learners, particularly during the winter or dull season, whenever this may be.
6. Offer a wide spread of short unit courses in evening school for the benefit of older learners and qualified workers.

All this is but saying in other words that under the present conditions in auto repair work, we would rate the all day school first as a feasible training device for beginners, the foreman instructor second, and the part time extension class third. For the mature worker, the evening extension class is the only agency that can be used effectively. For the very small community the correspondence school alone offers any help at the present time. Since the all day school is virtually confined to the larger communities, as is usually the part time extension class, the mass solution of the problem rests with the three agencies of the foreman as instructor, the evening school and the correspondence school.

Illustrations of the shift in the rating of the efficiency of different schemes because of differing general or local conditions can, of course, be multiplied without limit. The bricklaying trade presents a striking situation from the standpoint of training. While the manufacturer carries on production in a fixed shop, the bricklaying contractor shifts his work from building to building. This, together with the outdoor character of the trade and the small gang organization of his force, operates against systematic training on the job.

In teaching bricklaying the weekly part time extension class during the busy season is impracticable for a number of reasons. In the rush all workers employed on a given job are needed constantly. Consequently, time off to go to school interferes seriously with the work and the substitution of others for those absent at class is entirely impracticable. The fact that the gangs employed on most jobs are very small only accentuates this difficulty. It also presents at any given time a widely scattered group of learners or apprentices difficult to assemble for instruction at any given hour. As a building trade, bricklaying is a seasonal occupation in the Northern states, but usually an all the year around employment in milder climates. Consequently, under the former conditions, extension classes during the dull season offer an excellent means of training learners or apprentices.

There are no national or plant schools in bricklaying. Consequently, the problem of training workers is entirely local. Only three ways seem feasible. One is to give vestibule training to new recruits, ranging from three to six months, followed by placement as learners in the trade. The second is to provide dull season classes for beginners in Northern states. The third is evening school classes for the further training of competent journeymen. As devices for meeting the present situation, we would rate these schemes as A, B or C, respectively.

As bricklaying ranks among the strongly organized trades, the use of the vestibule school for training new recruits previous to employment is a controversial issue, as was the old four year preparatory course of the trade schools which failed, for obvious economic reasons, as a recruiting device. Employers favor this vestibule school as a necessary device for securing the required quota of competent bricklayers for the business, while the unions usually oppose it as a subtle device for overcrowding the trade. On the other hand, they favor the dull season and evening classes for the extension training of workers already employed. This

book has nothing to do with this controversy, any more than to point out that, in those centers where union regulations obtain, the solution of the problem lies in efforts to get better preliminary training either by foremen on the job or by a vestibule school, and to follow this with dull season and evening school devices.

It may be well also to show how differences in occupational conditions affect the efficiency of any training scheme when it is proposed for different occupations. Suppose, for example, that we consider the full time isolated industrial school as a means of inducting new recruits into the electrical work, carpentry, boiler making and locomotive engineering. Because electrical work is so largely technical and so little manipulative in its content, it lends itself well to laboratory instruction. Consequently, the day preparatory course is better adapted to this occupation than any of the others. The school can readily provide most of the machines and tools and processes of woodworking, but seldom is able to secure the opportunities for real experiences in building construction, as these must usually be carried on away from the school and its premises. Shop work in boiler making is utterly impracticable under a school roof because of the cost of the material and the size of the job, while the use of a locomotive and adequate trackage for training beginners, one by one, is unthinkable.

These observations are all confirmed by the facts. Probably the largest enrollment in all day industrial or trade schools is always in electrical classes. They have not been very successful with carpentry work. All boiler makers learn on the job either by the pick up method or from the foreman. Locomotive engineers are made by promotion from the ranks of firemen who learn, from the engineer with whom they serve in the same cab, all they know before undertaking this job. Progress in training for boiler making and locomotive engineering obviously lies along the line of organizing what is to be taught and getting foreman and engineer to teach it more effectively. While some progress

in training for electrical work and carpentry will be made by improving the instruction given to novices by full time day classes in these subjects, the need for help by vast numbers of novices and learners in these occupations will have to be met in some other way.

Situations and values—Roughly, there are three kinds of jobs. Some are almost entirely manipulative, requiring only a low grade skill and have very low technical content. These may be called low index jobs and are illustrated by the work of the weaver in a textile mill, the bricklayer, or the common plasterer. Some call for a considerable amount of medium grade skill, technical information, and job intelligence and are correspondingly, medium index jobs, such as carpentry or plumbing. Some call for either a low or high manipulative skill but have a large technical content and require the exercise of a high job intelligence, such as is required of the electrician or the tool maker. Each of these makes different demands on devices for training, as is shown by the following table. In it the different training schemes listed in the preceding table (Y) on Devices for Getting the Job Done are ranked in the descending order of the present tendency toward their use for training new workers. The numbers used in each column below refer to the corresponding numbers and schemes listed in the preceding table.

TABLE No. 11

Showing Comparative Tendencies in the Use of Different Training Devices for Jobs of Different Grades

<i>Tending a Ring Spinning Frame</i>	<i>Plumbing</i>	<i>Tool Making</i>
<i>A Low Index</i>	<i>B Medium Index</i>	<i>C High Index</i>
6	10, 11, or 14	9
7 or 8	—	11 and 3
1	4	5 and 4
	3	—
		7 or 8
		6
		—
		1

While the three occupations selected are typical of the grades of jobs each represents, it must not be understood that the training devices used correspond exactly with those used for all occupations of corresponding grade. Roughly, however, they do represent general tendencies. Tending a ring spinning frame is a machine operating job in a textile mill which requires quickness and dexterity but virtually no technical information. The prevailing practice is for the foreman on the floor to help the new worker. Some mills assign each new recruit to an experienced worker until he is able to tend frames for himself, usually still under the supervision of his instructor who, for this purpose at least, becomes the foreman instructor. Where this is not done or the foreman is negligent or incompetent to instruct, learning becomes the usual pick up task.

Even in these low index occupations, some firms have found it profitable to establish a vestibule course or school in manipulative operations for new recruits. One striking example of this is the preliminary training of new girls in paper box making described in the chapter on The Economic Theory of Vocational Education. Even this, however, is in essence a foreman instructor scheme for paid learners carrying on regular production under instruction in a special bay of the shop. It needs no discussion to show why all day schools, public or privately endowed, will probably never be established for these low index occupations.

In plumbing, which furnishes an excellent illustration of the medium grade occupation, the pronounced drift is toward the efforts of local associations of master plumbers sometimes in cooperation with the union. The preparatory trade course from two to four years in length has virtually been pronounced a failure as a training device for new recruits and learners.

Under the leadership of a National Apprenticeship Committee representing the National Association of Master Plumbers and Steam Fitters and its National Trade Extension Bureau, stand-

ardized teaching material has been prepared which local associations are urged to use. This material contemplates a brief vestibule course in a school for beginners, usually on pay. This course runs from two to six weeks, and is followed by part time extension training for a year during which apprentices attend instruction for from four to eight hours per week. After this period, they are to attend evening extension classes for a minimum of 100 hours annually, until they have completed a three years' apprenticeship or learners' period. The plan also provides evening instruction for helpers and journeymen. Obviously, such a scheme is superior to the isolated all day school or the evening school without trade connections. Where local associations fail to establish this plan, the community will continue to suffer in its plumbing service from the results of the pick up method which, according to the trade, are often deplorable.

Like all high index jobs, tool making requires for the really efficient training of capable machinists some form of school to teach related technical information and promote resourceful thinking about the work. This has led a considerable number of concerns to establish their own plant school, a plan which is best for them. Notable among these schemes are the schools of the General Electric Company, the Western Electric and the Ford Automobile Company. As a modification of this, some firms have adopted, individually, the Cincinnati or Schneider cooperative plan in some form, sending their promising learners or apprentices to a school for part time instruction. Usually this is operated as a two-boy plan for each job. Notable among these arrangements is that of the United Shoe Machinery Company with the public schools of Beverly, Massachusetts, described in a previous chapter.

Undoubtedly, capable boys who learn the fundamentals of the machinists' trade in an all day preparatory school have a large advantage over the trained worker on the technical and thinking side of the business, and therefore provide a promising

source for tool makers, after they have had a wide variety of experiences in the commercial shop. Obviously, such all day courses succeed best when they are operated in cooperation with local associations of employers.

Part time extension schools provide the next best scheme. Evening classes for qualified workers follow next. Near the bottom of the list, so far as technical help for mature workers is concerned, are placed the various foreman instructor schemes, followed by the omnipresent pick up method. Perhaps the most ideal combination would be proper training in processes as a paid learner by a competent foreman instructor, accompanied by part time instruction during the apprenticeship period, with the evening school to give pusher education as needed to meet the shifting changes and demands of the trade. This certainly furnishes the only hope for the mass solution of the problems in any complete and effective way.

The mass problem—The foregoing discussion has considered different training schemes largely from the standpoint of their efficiency as devices when available. As a matter of fact, few of them are available on any extensive scale in this country. "Getting the Job Done" means, if it means anything, providing help when needed for new recruits, learners and qualified workers. The trend is undoubtedly towards an extension of training service to long neglected groups of workers in a wide variety of occupations. This means the more extensive use of those training schemes which can be used for the mass education of workers. Consequently, it may be well here to compare all schemes from this standpoint in the table below.

In the column marked *Theoretical* the corresponding scheme is ranked in numerical order according to its comparative theoretical or assumed value or availability for teaching all beginners. In this, the worker, doing everything for himself by the pick up method, ranks first because in theory every worker has a chance according to his ability and ambition to learn. The scheme is

TABLE No. 12

Comparative Efficiency of Training Schemes for the Mass Education of Beginners

Scheme	<i>Descending Rank in Efficiency</i>	
	<i>Theoretical</i>	<i>Actual</i>
Worker does it all.....	1	15
Worker does it all with pure information service.....	2	14
Worker does it all with correspondence schools.....	3	9
Foreman does it all.....	4	1
Foreman instructor does it all.....	5	2
Visiting service man does it all.....	6	3
Local association does it all with no school.....	7	13
Union does it all with its own school.....	8	11
Local association does it all with its own school.....	9	5
Part time extension school does it all.....	10	4
Isolated day school does it all.....	11	6
Evening school does it all.....	12	8
Plant does it all with its own school.....	13	7
National association does it all with its own school....	14	12
National association does it all with outside school...	15	10

poor but open to all. Only a little less open to all self-taught learners are pure information service and the correspondence school. Since almost all workers have foremen who can, if they will, give help, the various types of teaching foremen are ranked next in the descending order of their frequency or prevalence (4, 5, and 6). In theory all local employers (7) in different lines can associate themselves for the purpose of promoting better workmanship among their employees, and unions can devote time and money to the instruction of their apprentice and journeyman members. Many local associations of employers can, if they will, establish a school for their employed young people (9). Part time extension classes (10) are feasible in all industrial centers for the medium and high index occupations. So is the isolated all day school for certain standardized trades (11), below which the evening school ranks as a scheme for inducting and training beginners because it is primarily a device for adult workers (12). Obviously, plant schools will always be limited to large concerns and the schools of national associations of employers will always be devices for the training in technical

leadership of small groups of carefully selected young people (13, 14 and 15). From the standpoint solely of its use for the mass training of beginners, the pick up method is theoretically the best and the National School the poorest scheme. If we omit the pick up methods entirely as utterly inefficient for new recruits, then instruction by the foreman will reach the greatest number of beginners, which is undoubtedly the truth.

In the last column of the preceding table, all these schemes are rerated from the standpoint of their actual value or feasibility for mass training as contrasted with theory. The pick up method, rated first in theory as a universal training device, ranks last as an actual scheme for reasons just given. The foreman instructor schemes are rated first in both columns because they are the most universal devices capable of most effective use in the organized instruction of new recruits and learners. Part time extension classes are rated fourth because they provide the only means for furnishing trade information to young learners while they earn. The isolated all day school is given a low rating as no reflection on its work, but because economic reasons will always restrict it to the larger communities, a few standard trades and a very small registration as compared with the number of employed youth in the same trades, and of the same age groups it serves. It is altogether probable that the total registration of corporation or plant schools will soon, if it has not already done so, exceed that of all the public and private day trade schools of the country. It will be noted that the evening school and the correspondence school are both rated low in their actual efficiency as schemes for helping beginners in occupations. They would rate high as devices for qualified workers, but they are not of the age or in shop group under consideration here. The propaganda efforts of local associations having no plan and no school are rated very low because of their futility, while national association schools rank poorly only because they are not in their very nature intended to be schemes for mass training. In

reality, the ratings as to the actual promise or value of these different devices for the extensive occupational training of new workers represent in the main the real tendency or trend in industrial education today.

The trend is undoubtedly away from the full time, long course, isolated day school, for reasons already thoroughly discussed in preceding chapters; and is for the same reasons toward the industrial training of all wage earners subsequent to employment. While many national associations of employers have become active in fostering training for their employees, the tendency everywhere is for them to work through local associations for its accomplishment. Everywhere the demand is for more specific occupational content as teaching material and for more direct methods in teaching it. More and more, the school is being used to supplement, not to take the place of, wage-earning training. Traditional school organization and content are giving way to industrial organization and content.

The movement, in so far as industry itself is concerned at least, is away from cold storage toward pusher education; from instruction only at formal and stated periods to continuous help whenever the need for it exists and the opportunity to take it arises; from long courses to short unit courses; from general technical knowledge to functioning information; from the departmental organization of teaching material to the use of the job as the core and subject of instruction; from the technically prepared teacher to the occupationally competent instructor; from theoretical ability to doing ability; and finally, we believe, from the isolated school and the isolated plant toward the cooperative plant and school.

A prophecy—In our industrial training schemes of every kind, the future will lay more and more emphasis on a real participating experience in an occupation as the only effective way to acquire either the environment habits, doing habits or thinking habits which it requires for satisfactory work, or for advance-

ment. This means more training on real jobs and less on pseudo ones. It also means that the full time, long term, isolated, non-cooperating day trade school will not play any considerable part in a national system of industrial education for the 12,000,000 workers of this country engaged in mechanical pursuits. It will do good work, without doubt, in centers of population for small groups of fortunate youth who are financially able and willing to spend the period from 15 or 16 to 17 or 18 years of age in getting a most valuable education and a good foundation in some of the processes and technical knowledge of standard trades in which many of them are destined to be leaders in the after years.

The task of mass training must be discharged, not by the isolated or self-contained school, but by the self-contained occupational group or the cooperating occupational group and the school. Most training in manipulative skill on real jobs will be given by the commercial shop. Wherever it is given by the cooperating school, which will be but seldom, it will be given under the control of the occupation, whether the school be a plant agency or an outside institution, just as it now is in the Beverly Part Time School and under the Schneider or Cincinnati plan. The school will then find its true place in this cooperation as an agency supplementing this shop training by the instruction it can give so much better than the shop in related technical auxiliary and even general technical information. It will also perform the same service in evening classes where horizontal trade extension will improve workers in their present jobs and levels of employment, and vertical trade extension will equip the more capable and ambitious for promotion and enlarged responsibility. This program will not by any means eliminate the school. It will only place it where it can render more efficient service.

Other Forms of Vocational Education

Thus far this chapter has considered the efficiency of various schemes for industrial education and the trend of the country

in their development and use. For a number of reasons the situation in industry differs greatly from that in agriculture, commerce and home making. Because the processes of the former are much more standardized, there has been, as already stated, a greater consideration of the need of efficiency and ways to get it, which has resulted in a much greater development of training for workers both in extent and in variety of schemes used. The almost infinite diversity in the size, organization, product, processes and operating conditions of industrial establishments has also accentuated this great difference. Outside the professions found in agriculture, and home economics, there has been very little standardization in these two fields of employment. With the exception of stenography, typewriting and bookkeeping, which include about 5% of all commercial occupations, this is equally true in commerce.

Consequently, when we turn once more to the list of fifteen training schemes used for industry given in the table on Devices for Getting the Training Job Done for Beginners, we find very few of them used in these other fields of employment. In all of them, the pick up method of learning is as prevalent as in industry, and in the case of agriculture and the home, probably more so.

The isolated full time day school (scheme No. 3) has been virtually the only device for organized instruction used in home economics until lately. Now, evening classes in the subject have had some development. In agriculture, we find only the full time secondary school in agriculture, (3); the visiting service man (8) who in this field is the county agriculture agent doing extension work among mature farmers; the short winter courses at the land grant colleges, which are dull season extension courses (5); and pure information service (15) through all manner of agriculture pamphlets and bulletins.

Commerce has used almost entirely the day business school (3). Here and there, a very few large concerns maintain training

schemes for their office and sales force or both (9). A few heads of service instruct clerks in the performance of their duties (6), and some information service is furnished the sales and special clerical force (15). Usually a clerk is employed on the assumption that he is clerically competent. If so, he stays; if not, he gives way to another. Conspicuous as a departure from this is department store training of salesgirls and the extension training for bank employees in the larger centers, conducted by the local bankers' associations as branches of the American Banking Institute.

The trend in agriculture—The trend in agriculture is decidedly toward a recognition of the value of educational service to the adult farmer through the extension work of land grant colleges, carried on by county agents and short winter courses. Under the stimulus of the Smith-Lever act, the work of these agents has been extensively developed in many states, while the winter or dull season courses are constantly growing in number and efficiency. In the all day secondary school in agriculture, the movement is toward part time work. In this, boys or girls conduct supervised projects in various lines of agriculture throughout the year, but attend instruction at the school during the late fall and winter months. More and more all these agencies are using specialized agricultural content as their teaching material, and are succeeding in proportion as they promote doing ability in agriculture as their objective rather than abstract and unusable scientific knowledge about plants and soil. Along with this, there are coming more direct methods of giving instruction and the adaptation of the time of giving training service to those seasons and hours at which the farmer and his sons and daughters can most easily and readily use it.

The trend in home economics—While the change in home economics is coming very slowly, the tendencies are very much like those described in industry and agriculture. Elementary training in the household arts has undoubtedly come to stay in the

high school as a liberal arts study. The real developments, however, are away from the full time day school toward extension training in evening school for those engaged in home or other employments during the day. One of the most pronounced forward steps has been the emphasis placed on practical sewing, cooking, sanitation, safety and hygiene, for the girls of the compulsory continuation schools now required by law in the towns and cities of some twenty-six states. In all this, the tendency is toward training subsequent to employment as the recognition of the value of this service to mature girls and women. This is bringing pronounced changes in the instructional material. Courses are now being set up which are based on a real analysis of home making occupation. More real occupational content is being taught for use and more direct methods are being employed in teaching it. Ability to do home work properly and intelligently is becoming more important than test tubes and calories. Less is being said these days about college entrance requirements in the subject and more about the social values of home making as a means of teaching people how to live!

The trend in commerce—Changes in commercial education are probably coming most slowly of all. This is partly due to the academic set of commercial departments in local high schools. The business or commercial school arose as a private business venture to meet the need of preparatory training in bookkeeping, and later in typewriting and stenography, the last two of which at least were new and highly specialized occupations no office could teach. When commercial departments were established in the public high schools, they adopted and perpetuated the same courses of instruction.

The shift and flux in the occupations of the commercial world are almost as great as in industry. New and changing conditions make corresponding demands for service in the adaptation and readaptation of workers. To all this, the public commercial school or department has usually remained singularly blind and

indifferent. Most private business schools have been scarcely less so. As a result, they have become on the whole special agencies for preliminary training in only three employments, leaving more than 95% of the commercial occupations to their own devices. Many of these pay better salaries; offer larger opportunities for advancement; call for more technical knowledge and job intelligence than the traditional lines which the business school fosters; and are usually learned entirely by the pick up method.

Those in charge of public commercial education have in the past apparently conceived it to be the duty of the public schools only to serve the needs of the commercial world for stenographer, typist and bookkeeper; only to meet that need in those occupations using these arts which require full high school education for success; and only to serve those who are able financially and otherwise, as well as willing, to give four years of preparation for employment before wage-earning. Of the four fields in secondary vocational education, industry, agriculture, home economics and commercial, the latter has undoubtedly, so far as the public schools are concerned at least, made the least progress in the adaptation of its service to the real situations and needs of the commercial world, and has therefore been the most isolated and least democratic in its policies and practices. Home economics has been but little more so. Indeed, measured by the extent to which they have attacked the problem of mass training, the schools of the four fields should be ranked exactly in the descending order in which they have just been listed above.

Nevertheless there are here and there signs of a breaking away from these traditions. These indicate a greater realization of the existence of other commercial occupations and the special kinds and grades of demands they make on their workers. The trend, if such it may as yet be called, is away from a few standard subjects of extensive use. Among the newly taught subjects, banking, insurance, railroad work, advertising and a wide variety

of salesmanship are conspicuous examples. There is a growing recognition of the greater need in most commercial occupations, because of their special technical or specialized character, for training subsequent to employment through part time and evening extension classes. This applies, for example, to C P A's, many different kinds of salespeople, railroad clerks, bank clerks, insurance clerks and stenographers discharging highly specialized responsibilities. All this is emphasizing the need for the study of commercial occupations to get their true occupational content so that more directly usable teaching material may be taught by more direct methods.

As in the case of home economics, the compulsory continuation school is developing for juveniles in commercial pursuits, an entirely new occupational content as its teaching stuff. The kinds of duties these workers perform as recruits and learners are more or less routine. They call for little of what might be called skill or special technical information but do require, as a condition of success, the development of certain *commercial habits* usable in all commercial occupations, such as correct ways of handling mail, answering the telephone, operating an office switchboard, filing letters, writing telegrams, making out deposit slips, requisitions, orders, bills of lading, stock records and the like, running errands, and handling customers and callers. As a result, commercial teachers are, apparently, concerned for the first time with junior commercial occupations and their demands on new recruits. This is already operating in some places to change view points and procedures, as well as to enrich the traditional commercial courses of the senior high school with greatly needed occupational content.

A prophecy for agriculture—In the agriculture education of the future, all the present drifts toward mass training will continue. Agricultural schools and classes, both secondary and professional, will be used more to supplement, than to prepare for, real economic experience on farms and in farming processes.

The agricultural departments of consolidated high schools and county agriculture schools like the day industrial and trade schools of the cities will for economic reasons continue to be, at the most, comparatively few in number. Isolated self-contained schemes for teaching agricultural processes and related technical information on the school premises have been a sad disappointment both in the numbers reached and results accomplished. As agriculture departments in rural high schools organized to conform to college entrance requirements and as feeders to the land grant colleges, they have been little less so. Where, under the stimulus and support of national and state laws, these agriculture and county schools have broken away from traditions to serve the real occupational needs of the countryside, much excellent work has been done that points the way for the future.

The specific occupational content of the agriculture employments of the locality are being studied. Teaching material is being developed that functions in the real demands of farm life, and this content is being taught by more direct methods. Real participating experience, so easily provided on the home farm and supervised by the school, is being more and more made the basis or core of instruction. In fact, most of the really effective vocational work in secondary agriculture today is being done through schemes that are, essentially, as much part time schemes and classes as those used by industry. On the home acres and sometimes also at the well equipped state or county school, the student gets supervised practice in poultry keeping or dairying, or swine herding or farm mechanics or fruit raising or with different crops. At the same time the school gives technical knowledge and promotes job intelligence about the work in hand. Through the school supervision, which all these conditions make possible, a degree of control over these participating experiences is secured that few part time industrial extension classes enjoy.

Nevertheless, these secondary schools can never become the solution of the mass problem in agriculture training. The com-

parative lack of resources, backwardness and inertia of the rural community would prevent, even if the distances and geographical barriers of the areas to be served did not. These schools will continue to do good work for the groups they reach and are destined to have a substantial increase in number and attendance in more progressive farming areas. Their field of service will be greatly enlarged as they become devices for giving pusher education through extension training in the dull season of the year to all those following agriculture occupation in the neighborhood, regardless of age. This is the present drift in these schools.

With the possible exception of home economics, no other school has anything like the opportunity of these classes in secondary agriculture to become touchstones of service for all the youth of the section they serve. Unlike the students in industrial and commercial courses, all rural students furnish both a background of participating experiences in farm activities and an opportunity for continued supervised practice in selected farming projects. For the youth he reaches, the agriculture instructor can and does do better work than any county agriculture agent can hope to accomplish as a peripatetic trainer of large numbers of farmers scattered over wide areas.

As in industry, however, the mass problem will always be the adult farmer. For reaching and helping him nation and state have made extensive and commendable provision through the work of the land grant colleges. This provision ranges all the way from furnishing bulletins of information on almost every conceivable farm matter to short winter courses in a wide variety of farm subjects, and to the extension service of the county agent, through whom the college carries its work to the farmer's door. As a result of experience in dealing with the problem, this educational service for the mature farmer is giving more and more attention to his emergency needs. Sometimes, as in the case of pests destroying a neighborhood crop, this requires group

treatment, but, in most instances, it calls for individual help in some form. Along with this, instruction is becoming still more special in its objective, content and method. Extension training for the employed farmer has almost completely freed itself of the academic handicaps that still shackle us in other fields and prevent us from dealing with the occupational training of workers as primarily an economic and not a cultural matter.

This discussion would not be complete without alluding to the educational effect of the numerous farmers' cooperative movements that have arisen in the past decade in every section of the country. Both directly and indirectly, these movements, fostered by national associations and working through local associations, are destined to train millions of farmers on the purchasing, marketing, accounting, and business side of their special farming enterprises, and to do this far more effectively than any school. Some of these associations will also succeed in teaching their members better methods of special farming because of their common interests and understanding.

On the whole, agriculture education as a mass problem is much farther along than any other form of vocational training. Admittedly, its problems are much simpler than those of industry, but it sees them more clearly and has set up a definite policy and procedure well adapted to meet them. Supported in this program by a nation-wide feeling that agriculture is the economic basis of our continued prosperity, we may expect this form of vocational education to lead all others in numbers served and results accomplished.

A prophecy for home economics—Vocational training in home economics will develop only as it gives increased attention to older girls out of school and to adult women. Leaders in this work are beginning to realize that household arts and home economic training in the full time schools will always occupy about the same place and serve somewhat the same functions as manual training and mechanic arts work. Like them, it is needed

as a form of general education. With the limited time it can command in the curriculum, however, its vocational results in home making will always be comparatively small.

All experience with the attempt to establish distinct full time day schools or classes in home making show that there is little demand for this type of training and probably never will be. It certainly will never furnish any solution of the mass problem. There is no economic incentive to induce school girls to make thoroughgoing preparations for home duties. There are no standards in household work established and enforced in American homes which require two years' attendance on a preparatory course by any prospective home maker.

The home economics instruction, which has become such a feature of compulsory part time classes for working girls, is intensely practical. It properly has even more pedagogical value than the household work of the full time school. Its most important service, however, is the setting of tastes and standards in home activities very much needed by many girls, at least, in the groups taught. Since most if not all working girls may safely be presumed to perform a considerable amount of home service outside their hours of wage-earning, this instruction in home making becomes for them real extension work. It is therefore a valuable step in the direction of mass training, if we assume they need from the class nothing else more important.

The problem, however, from the standpoint of numbers, still remains that of giving increased attention to those beyond the compulsory school age who are employed full time in the home. When the farm home is included, the number of these housewives, house daughters and servants becomes about 40,000,000—a huge field as yet almost untouched. As in the case of industrial workers, they must be served, if at all, by training subsequent to employment. Home economic teachers are not as a group keenly alive as yet to the existence and need of this huge mass of people, much as they talk about the importance of the

subject to the well-being of the American home and of the nation. Upon them as teachers rests the grave responsibility of making their subject function in the practice and ideals of that home. Progress will be made, not by refining the processes of household arts instructions in the full time school, but only as evening and part time classes are developed for giving pusher education through short unit courses bearing on every phase of the many sided job of conducting, conserving and improving a home.

Because all the leaders in this field of vocational education have been technically trained to a comparatively high degree in its subject matter, there is great need for them to approach the problem before them from the standpoint of the real occupational content found in home making. What is needed is not formal technical knowledge, but functioning information for use under actual conditions, taught by demonstration and fixed by practice in real home jobs. The path of progress lies in the direction of making home economics for the real home maker less of a science and more of an art, less of an accomplishment and more of a tool in trade. This applies also to the informational service about home making subjects for farm women which is furnished by the land grant colleges and because of their isolation, will probably always be the only extensive means of helping them.

A prophecy for commercial education—On the whole, present commercial courses in the high schools serve as an excellent source of supply for capable stenographers, typists, bookkeepers and general clerks who, with their better general education, are equipped for advancement to the best positions in these lines. On the manipulative side of these arts the high school training still lacks the directness and thoroughness of the work done by private business colleges with students of comparatively less native ability and education. The whole field of junior occupations in the commercial field offers large opportunities for equipping great numbers of boys and girls with desirable com-

mercial habits and an elementary knowledge of simple business procedures before entering upon employment, a service which the compulsory continuation school is now developing in some centers. But the full time school can never meet this situation until it is willing to consider certain grades of commercial training a worth while public service, in addition to those which are restricted to the upper grades of the Senior high school.

As in all other fields, however, the mass problem can only be met by training subsequent to employment. In many commercial lines, such as department stores and insurance, we shall see an increasing number of large companies providing the special training required by employees for different occupations in their service just as many manufacturing plants are doing for their workers. National associations for different commercial activities, such as real estate and advertising, will do what the American Banking Institute has done through its local chapters for bank clerks. Much more can and will be done through the special instruction given by heads of service—called in the industrial field, foreman instructors—while the informational service now so much a feature of some commercial pursuits will undoubtedly be greatly extended in many lines. Even when national associations, local associations and the big companies have wisely assumed their opportunity and responsibility for the instruction of their own workers, the large majority of employed commercial workers will still remain unserved.

The special related information required by many people must be given through evening classes, supplementing, not preparing for, daily employment. For reasons that need not be given here, the part time extension class will probably not be used as a training scheme very extensively in this field. Public schools can learn much about the character and demand for this service from the extension departments of our urban universities. The situation is certainly not met by evening practice classes in stenography and typewriting for beginners. Because of the for-

mal and academic character of the teaching material and procedures of most of our school efforts in commercial education, there is the gravest need for the careful study of the functioning occupational content of many old as well as new occupations. Only in this way can these extension classes teach direct information that will function in an improved doing ability. Only those who are occupationally competent and abreast of current practice and needs will be employed as instructors. Because of the special and direct character of this information, the services of experienced experts will be required for many groups. Only in this way will the teaching content of such courses be constantly adapted to the changing conditions and requirements of the commercial world.

QUESTIONS AND POINTS FOR DISCUSSION

1. Find out what schemes of industrial training are being maintained in your community or, if not in your own community, in some other one. Classify all these schemes under the list of schemes found in the table given in this chapter.
2. Rate these schemes according to your opinion of their theoretical and actual efficiency and give the reasons for your rating.
3. What schemes, if any, of industrial training have been started in your community and later discontinued? What was the cause of their failure?
4. Do the same things for commercial training, called for in questions 1, 2 and 3 above.
5. Do the same things also for home economics training and for agricultural training.
6. Get from your local Commercial Club or other similar business association a list of all the principal occupations of your community. List these in one column and in a parallel column state the opportunities for training open to their workers. In doing this, use the schemes for training furnished by the table given in this chapter.
7. A certain community of about 100,000 population has just established a Junior College giving resident training in a two years' course for entrance to the Junior Year of the State University and of other higher institutions of learning. It has a commercial department in the

local high school in which almost all of the commercial subjects are postponed until the last two years of the course. Local business colleges flourish. There is a course in manual training which includes wood working and metal working and printing offered in two cosmopolitan high schools, each of which also offers some elementary work in the household arts. Thirty-five per cent of their graduates attend college. There are no provisions for vocational training of secondary grade except a few evening classes under the Smith-Hughes Law. Rate this community as to: 1. a democratic education; 2. recognition of differing needs and aptitudes; 3. wise investment of public money.

8. Get from your State Board for Vocational Education the number of youth from 16 to 21 years of age residing in the rural communities of your State. (Communities of less than 2,000 population including farms.) Get also the total numbers being reached by vocational agriculture through full time courses and through part time extension courses. Find the percentage reached and served by full time classes, part time classes and all classes. What are the causes of these low percentages? What is the remedy?
9. Find the total number of girls and young women in your State between 16 and 21 years of age. Get from your State Board the members between these ages receiving training through the public schools in vocational home making and elementary household arts. Get the percentages for each and all of these services. What are the causes for these low percentages? What is the remedy?
10. Pursue this same method for the women of the State in towns and cities who are over 21 years of age.
11. Get the names and addresses of 10 persons who are taking correspondence school instruction. Interview them to learn: 1. the relationship of this training to their present jobs; 2. their ability to take the work successfully; 3. the extent to which their previous experience has prepared them for the course; and 4. their success with the course. Rate this method of training on the basis of this study as compared with extension training in evening school, using the figures A to E.
12. Why do so few employers train their own workers properly?
13. Why do so few unions provide any training outside the shop for their apprentices? For adult members?
14. Why do so few farmers train their own sons properly? And why do so few mothers instruct their daughters effectively in home duties and responsibilities?
15. Do you believe that public and private schools can discharge this task for Society under these conditions? Why?

BIBLIOGRAPHY

Plant Schools. The reader will secure information best by writing the director of education or other official having charge of the training work of such institutions as: General Electric Company, Lynn, Mass., and Schenectady, N. Y.; Bethlehem Steel Works, Bethlehem, Pa.; Westinghouse Company, Pittsburgh; Western Electric Company, Chicago; Standard Oil Company, Bayonne, N. J.; International Harvester Company, Chicago; American Rolling Mill Co., Middletown, Ohio; Simonds Saw Works, Fitchburg, Mass.; Cheney Bros. Silk Works, South Manchester, Conn.; the Apprenticeship Training given by the Santa Fé R.R. with headquarters at Topeka, Kansas.

Cooperative Schools (between employers and private school systems). Information about typical schemes can be secured by writing to the schools or to the community or to such plants as the United Shoe Machinery Company, Beverly, Mass.; the part time schools of Fitchburg, Mass., and York, Pa.; the part time classes of Dunwoody Institute with the Soo Line, Milwaukee, and M. and St. L. shops in Minneapolis; the part time classes for textiles and printing in New York City; the part time classes of Milwaukee operated by the Milwaukee Continuation School; the part time classes for bricklayers and tile layers at Los Angeles; the part time classes for bakers at the Washburn School, Chicago, and Filene Bros., Boston. For a rather complete list of such schools up to 1921, see the Report on Part Time Education, by H. B. Smith, published by the Federal Board for Vocational Education, Bulletin No. 73.

National Association Schools (employers). Information about these can be secured by writing to such institutions as: the American Institute of Baking, Chicago; Dunwoody Institute (baking), Minneapolis; the National School for Marble Setters, University of Tennessee, Knoxville; the United Ty-

pothetæ School, Indianapolis, Ind.; the National Tile Layers' Course, Beaver Falls, Pa.; the National Research Bureau (plumbing), Evansville, Ind.; the National School for Tanners, Pratt Institute, Brooklyn; the National School for Pressmen, Johnson City, Tenn.; the National School for Foundry Foremen, University of Illinois, Champaign.

National Trades Union Schools. The correspondence courses of the International Typographical Union and the National School for Pressmen, Johnson City, Tenn.

National Associations promoting training by their trades, industries or pursuits. There are many of these. Here is a partial list only: National Metal Trades Association; National Foundrymen's Association; American Association of the Baking Industry; National Retail Bakers Association; National Tile Manufacturers Association; National Marble Manufacturers Association; United Typothetæ of America; National Pulp and Paper Makers Association; National Cracker Manufacturers Association; National Association of Master Plumbers and Steam Fitters; American Bankers Association; Southern Textile Manufacturers Association; International Association of Painters and Decorators; the National Wall Paper Manufacturers Association; the American Construction Council; the National Laundrymen's Association.

Local Association Schools. The American Banking Institute; schools for the building trades in most of the large cities including Chicago, San Francisco, Detroit, Cleveland, and Minneapolis; plumbing classes teaching standardized course of the National Association of Master Plumbers and Decorators; the part time classes at York, Pa., enthusiastically supplemented by the local Commercial Associations of that city.

Correspondence Schools, such as the I.C.S., Scranton, Pa.; the LaSalle School at Chicago; and the American Correspondence Schools.

The Reports of the National Association of Corporation Schools. Apprenticeship Education. Federal Board Bulletin No. 87. Government Printing Office. Gives an extensive list of apprenticeship schemes now in operation; analyzes these by types; points out the problems to be met; discusses the conditions for success; and suggests methods and devices for securing them.

Part Time Cooperative Courses. Federal Board Bulletin No. 78. Government Printing Office. Gives a complete list of such courses up to the time of the publication. Analyzes these by types. Describes some prominent illustrations of each type. Presents the conditions necessary to make such schemes effective and methods and devices that have proved most successful.

Magazine Articles on Corporation Schools:

Vocational Education Magazine, June, 1924

Industrial Management, October, 1922; January, 1924

Pedagogical Seminary, December, 1922

Journal of Social Forces, January, 1924, pp. 208-211

Journal of Political Economy, November, 1921, pp. 721-745 and 697-709

Machinery, March, 1924, pp. 524-525

Factory, January, 1923, pp. 30-32

Journal of Electricity and Western Industries, August, 1922, pp. 135-136

See also Bibliography for Chapters VI, VII, IX, XI and XII

CHAPTER XVI

FEDERAL AID TO VOCATIONAL EDUCATION

While the National Government appropriates money for both professional and secondary instruction in vocations, this book is concerned only with the latter. This grade of vocational training is found throughout the country in the four fields of agriculture, industry, commerce and the home. It is given by many different agencies in many different ways. All these agencies and schemes may be broadly classified as either private or public. Attention has been given to private effort in the chapters on Efficiency Factors in Vocational Education and Getting the Job Done. Public vocational education includes all schemes and classes controlled by public officials and supported by funds raised by taxation. All public schemes of vocational training in this country can be classified under these heads: those supported in part by federal funds, those supported entirely by state and local funds, and those supported entirely by local funds. This chapter deals almost entirely with the first group of schools and classes.

No such adequate treatment of federal aid for vocational education and the National Vocational Act can be given here as their importance in the movement justify. The discussion will therefore be confined to a general, rather than any detailed or technical presentation of the subject.

The need for vocational education—The need for vocational education in the States has perhaps been most thoroughly set forth in the Report of the Commission on National Aid to Vocational Education whose recommendations led to the adoption

of the Vocational Education Act. The arguments and conclusions of the Commission on this point may be epitomized very briefly as follows.

~There is a crying economic need for vocational education. The two great assets of a nation which enter into the production of wealth, whether agricultural or industrial, are natural resources and human labor. The conservation and full utilization of both of these depend upon vocational training. This vocational training is required: 1. To conserve and develop our natural resources; 2. to prevent waste of human labor; 3. to provide a supplement to apprenticeship; 4. to increase wage earning power; 5. to meet the increasing demand for trained workmen; 6. to offset the increased cost of living; 7. as a wise business investment; 8. and because our national prosperity is at stake.)

The social and educational need for vocational training is equally urgent. It is needed to democratize the education of the country: *a.* By recognizing different tastes and abilities and by giving equal opportunity for all to prepare for their life work; *b.* by extending education through part time and evening instruction to those who must go to work in the shop or the farm. Vocational education is also needed for its indirect but positive effect on the aims and methods of general education: *a.* By developing a better teaching process through which children who do not respond to book instruction alone may be reached and educated through learning by doing; *b.* by introducing into our educational system the aim of utility to take its place in dignity by the side of culture and to connect education with life by making it purposeful and useful. Industrial and social unrest is due in large measure to a lack of vocational training. Higher standards of living are a direct result of better education. The testimony in behalf of vocational education comes from every class of citizenship. Public sentiment shows the need for it. (See Report of the Commission, 1914, Vol. I, page 18 ff.)

The need of national grants to the State—The need of national

grants to the State for vocational education is discussed at length in the body of the Commission's Report, and is well epitomized in a Summary of Findings. (See Vol. I, page 12 ff.) National grants for agricultural and trade and industrial education are justified: 1. By the urgency of the demand for the effective training of our workers which the States cannot meet in time without Federal encouragement and aid; 2. by the interstate and national character of the problems due to its nation wide interest and importance; 3. by abundant precedent, in appropriations by Congress throughout our entire history, for educational purposes and in cooperation between the Federal Government and the States, where team play was necessary to handling matters that could not be as well handled by the States alone; 4. by the successful results to the Nation as well as to the States of previous grants for educational purposes; 5. by the fact that an overwhelming public sentiment favors national grants to the States for vocational training of less than college grade for the duties of the farm and the shop; and finally, 6. by the greater importance of the human problem of preparing our people for life and for work over that of many purely physical problems on which we expend Federal moneys.

The best way to aid the States in giving vocational training is through grants for the preparation of efficient teachers and grants for the part payment of their salaries. National grants are required for these purposes: 1. To help solve a problem too large to be worked out extensively and permanently save by the whole nation; 2. to help the States to carry the cost of giving vocational education; 3. to share with the States in the large task of preparing workers whose tendency to move from State to State is making training for a life work a national as well as a State duty; 4. to provide National assistance in solving a problem too large to be worked out extensively and permanently save by the whole nation; 5. to give interest and prestige in the States to the work of preparing our youth for useful and productive service;

and 6. to secure expert information from the agencies of the National government and thus insure a country-wide knowledge and view-point which will put the work of the States on a successful and business-like basis.

Social principles for grants in aid—As the result of 300 years of experience in dealing with the problem, the English government has established a very definite policy with regard to grants made by the Central government to the local government for any social purpose. In a little booklet published some years ago under the title, "Grants in Aid," Sidney and Beatrice Webb describe the evolution of the principles underlying this policy, which they summarize in terse fashion substantially in these words: "Grants in aid from the Central government to local governments are necessary: 1. To encourage local communities to undertake new and needed forms of service for the common good; 2. to equalize unequalities of burden among local communities due to their widely differing problems and taxing resources; 3. to secure effective cooperation between Central government and local government in the conduct of the enterprise; and 4. to insure an irreducible minimum of efficiency in the conduct of the enterprise which will safeguard the proper expenditure of the grant for its declared purpose.

The application of these social principles to Federal grants to the States was first set forth definitely in the Report of the Commission on National Aid to Vocational Education (1914). In this, the Commission set up as the basis of its recommendations these fundamental ideas:

1. Vocational education being essential to the National welfare, it is a function of the National Government to stimulate the States to undertake this new and needed form of service.
2. Because of their widely varying problems and taxing resources, Federal grants are necessary in order to equalize the inequalities of burden among the States in the establishment and maintenance of vocational schools and classes.

3. Since the Nation is vitally interested in efficient vocational training, Federal grants for the work should secure for the National Government, the right to a reasonable extent of participation with the States in the common enterprise, without interfering with their autonomy in the content of their own affairs.
4. Only by such cooperation can minimum standards of efficiency be established and maintained for the vocational schools and classes of the various States, for which Federal moneys are expended and will the use of such moneys for the specific purposes intended be insured.
5. Only by such cooperation can an efficient country-wide system of vocational education be established and maintained.

The bill recommended by the Commission was with only slight changes adopted almost unanimously by both branches of Congress as the National Vocational Education Act (1917). In doing this, Congress accepted, not only the recommendations of the Report but its theory or philosophy as to the principles on which National grants to the States for any social purposes should be made. These same principles are embodied in the Agricultural Extension Act and the Maternity Act and we may expect to see them recognized and applied in the future as a permanent national policy. As the agency charged with the administration of the funds allotted to the States, under the Vocational Education Act, the Federal Board for Vocational Education has accepted and carried out the spirit of the fundamental ideas on which it is based.

In the Vocational Education Act, the stimulation of the States to undertake this new form of education is accomplished by grants of moneys from the Federal Treasury to be expended by the States for its support. The burden of carrying on this work among the States is equalized by supplementing their local funds with allotments from the larger taxing resources of the Nation as a whole. A degree of participation in the work is purchased

for the National Government by defining the kind of vocational training for which federal moneys may be expended by a State, and by leaving the States entirely free to accept or reject the proposal of cooperation by the National Government in the enterprise. Proper standards of efficiency in the schools and classes maintained by the States and supported in part by federal funds are safeguarded in the law and in the administrative duties with which the Federal Board for Vocational Education is charged by the law. The way is paved in the act for helpful and constructive cooperation between Federal and State Boards in the promotion and development of effective schemes of vocational training.

The general provisions of the act—Under it, the Federal Government does not propose to undertake the organization and immediate direction of vocational training in the States but does agree to make from year to year substantial financial contribution to its support. It undertakes to pay over the States annually certain sums of money and to cooperate in fostering and promoting vocational training and the training of vocational teachers. The grants of federal money are conditional, and the acceptance of these grants imposes upon the States specific obligations to expend the money paid to them in accordance with the provisions of the Act.

Three appropriations are made to the States—One appropriation is made for the salaries of supervisors and teachers of agricultural subjects; one for the salaries of teachers of trades, home economics and industrial subjects; and one for the training of teachers of all these subjects. In the first year, each of these appropriations was roughly \$500,000. By a step rate performance, each of the first two appropriations increases at the rate of \$250,000 annually until each reaches a maximum of \$3,000,000 in 1925-26; while the appropriation for teacher training increasing at the rate of \$250,000 annually reached its maximum of \$1,000,000 in 1919-20. Two years from this writing, 1925-26,

all the federal grants will have reached their total maximum of \$7,000,000, at which sum they will, under the Act, continue annually.

The fund for agricultural teachers is allotted to the States according to their rural population; for trade, home economics and industrial teachers, according to their urban population; for teacher training, according to their total population. Any sums allotted to a State for any fiscal year is, in essence, returned to the Federal Treasury if it is not expended during that year. A Federal Board for Vocational Education composed of nine members representing agriculture, employers, labor and education, is charged with the administration of these funds under the conditions set forth in the Act and summarized below.

The Legal Requirements of the Act

These are so well set forth in the First Annual Report of the Federal Board (1918) that they are summarized here in substantially the same language:

I. *As to the expenditure of appropriations.* They must

1. Be devoted exclusively to the maintenance of teacher training, and to the payment of salaries of teachers, supervisors or directors of agricultural subjects, and of teachers of trade, home economics and industrial subjects, having the minimum qualifications set up by the State Board with approval of Federal Board.
2. Be met by equal appropriation from State or local community or both.
3. Be withheld whenever it shall be determined that such moneys are not being expended for the purposes and under the conditions of the Act.
4. Not be applied directly or indirectly to the purchase, erection, preservation or repair of any building or buildings or equipment or for the purchase or rental of lands

✓ or for the support of any religious or privately owned or conducted school or college.

II. *Upon the State.* In order to receive federal moneys for vocational education, the State must first:

- ✓
1. Accept through its legislature the provisions of the Act.
 2. Designate or create, through the legislature, a *State* board consisting of not less than three members having necessary power to cooperate with the Federal board in the administration of the Act.
 3. Appoint, through legislative authority, as custodian for appropriations allotted its State treasurer who shall receive and provide for the proper custody and disbursements of all money paid to the State from Federal appropriations.

✓ III. *Upon the State board.* The State board shall as a general prerequisite:

1. Prepare plans showing: *a.* The kinds of vocational education for which it is prepared that the appropriation shall be used; *b.* the kinds of schools and equipment; *c.* the courses of study; the methods of instruction; and *d.* the qualifications of teachers.
2. Submit such plans to the Federal board for approval.
3. Make an annual report to the Federal board on or before September 1 of each year on the work.

✓ IV. *As to agricultural subjects.* In order to secure the benefits of the fund for agricultural education, the State board must include in its general plan submitted to the Federal board for approval these standards and requirements:

1. Qualifications of supervisors and directors.
2. Plans for the training of teachers.
3. Plans for the supervision of agricultural education.
4. Education shall be that which is under public supervision or control.

5. The controlling purpose of the education is to fit for useful employment.
 6. The education shall be of less than college grade.
 7. Education is designed to meet the needs of persons over 14 years of age, who have entered upon or are preparing to enter upon the work of the farm or of the farm home.
 8. The State or local community, or both, shall provide the necessary plant and equipment determined upon by the State board, with the approval of the Federal board, as the minimum requirement for such education in the schools and classes in the State.
 9. The amount expended for the maintenance of such education in any school or class receiving the benefit of Federal appropriation shall be not less annually than the amount fixed by the State board, with the approval of the Federal board as the minimum for such schools or classes in the State.
 10. Such schools shall provide for directed or supervised practice in agriculture, either on a farm provided for by the school or other farm, for at least six months per year.
 11. The teachers, supervisors, or directors of agricultural subjects shall have at least the minimum qualifications determined for the State by the State board, with the approval of the Federal board.
- V. *As to trade, home economics and industrial subjects.* In order to secure the benefit of the fund for these subjects, the State board must include in its general plan these standards and requirements:
1. Education will be given in schools or classes under public supervision or control.
 2. The controlling purpose of the education shall be to fit for useful employment.
 3. The education shall be of less than college grade.

4. The education shall be designed to meet the needs of persons over 14 years of age who are preparing for a trade or industrial pursuit or who have entered upon the work of a trade or industrial pursuit.
5. The State or local community, or both, shall provide the necessary plant and equipment determined upon by the State board, with the approval of the Federal board as the minimum requirement in such State for education for any given trade or industrial pursuit.
6. The total amount expended for the maintenance of such education in any school or class receiving the benefit of such appropriation shall be not less annually than the amount fixed by the State board, with the approval of the Federal board, as the minimum for such schools or classes in the State.
7. Schools or classes giving instruction to persons who have not entered upon employment shall require that at least one-half of the time of such instruction be given to practical work on a useful or productive basis, such instruction to extend over not less than nine months per year and not less than 30 hours per week.
8. At least one-third of the sum appropriated to any State for salaries shall be applied to part time schools or classes for workers over 14 years of age who have entered upon employment, and such subjects in a part time school or class may mean any subject given to enlarge the civic or vocational intelligence of such workers over 14 and less than 18 years of age.
9. Part time schools or classes shall provide for not less than 144 hours of class room instruction per year.
10. Evening industrial schools shall fix the age of 16 years as a minimum entrance requirement and shall confine instruction to that which is supplemental to the daily employment.

11. The teachers of any trade or industrial subject in any State shall have at least the minimum qualifications for teachers of such subject determined upon for such State by the State board, with the approval of the Federal board.
12. Cities and towns of less than 25,000 population, the State board, with approval of the Federal board, may modify conditions as to length of course and hours of instruction per week for schools and classes giving instruction to those who have not entered upon employment, in order to meet the particular needs of such cities and towns.

VI. *As to teacher training.* In order to secure the benefits of the fund for the training of teachers, the State board shall include in its general plan these standards and requirements:

1. Training shall be carried on under the supervision of the State board.
2. Training will be given in schools or classes under public supervision or control.
3. Training will be given only to persons who have had adequate vocational experience or contact in the line of work for which they are preparing themselves as teachers, supervisors or directors, or who are acquiring such experience or contact as a part of their training.
4. The State board, with the approval of the Federal board, shall establish minimum requirements for such experience or contact for teachers, supervisors or directors of agricultural subjects and for teachers of trade, industrial and home economics subjects.

The main questions for the national authorities to meet in the use of Federal moneys—The Federal board has two questions which must always be met in determining whether a State is entitled to share in the distribution of Federal funds: 1. Is the

plan proposed by the State one which is in conformity with the provisions and purposes of the Act, in which case it must be approved? 2. Will or can the State properly carry out the plan after it has been approved? The law requires the Board annually to ascertain whether the several States are using or are prepared to use the money received by them in accordance with its provision.

In the matter of institutions (schools) using Federal moneys, the Federal board is concerned with three things: 1. Whether the institution is legally qualified under the Act; that is, does it meet the legal requirements for such schools described above; 2. whether supervision and inspection by the State board for vocational education is properly maintained; and 3. whether the courses are carried on in conformity with the plan as agreed upon between the Federal and State boards.

State boards are concerned with these main questions—1. Is the plan of vocational training for the State one that will secure the best results in this work, taking into consideration the progress of the work and the given conditions to be met? 2. Is the plan one which the State board can successfully put into effect? 3. Are State supervision and inspection of local schools and classes properly maintained? 4. Do the institutions applying for Federal moneys meet the legal requirements of the Vocational Education Act? 5. Do the courses carried on by these schools or classes conform to the plan of the State board which it has agreed with the Federal board to execute.

The questions vital to local authorities—These questions are vital for local authorities in charge of public vocational schools for which they desire or expect to receive Federal moneys. Those questions are: 1. Have allotments of Federal funds been made to the State for the kind of vocational work which the school gives? 2. Is the school legally qualified under the Vocational Education Act? 3. Are its courses for which it proposes to use Federal funds carried on in conformity with the stated plan of the State board? 4. Is the work of the school approved by the

agents of the State board? 5. Does the State supplement the Federal allotment with appropriations from the State treasury for the same purposes? 6. What is to be the basis and the total amount of aid received by the school from both sources?

Mandatory and discretionary standards—Standards for the work of schools receiving Federal moneys are established in the Act through mandatory provisions and through provisions where discretion and interpretation are left to the Federal board in its dealings with the several States. As the Board must administer the Act in exact conformity with its terms, no choice can be made or discretion exercised in dealing with these mandatory provisions. For example, the Board is charged with seeing that the instruction in all subjects shall be of less than college grade and that evening schools shall not admit students under 16 years of age and shall give only such training as is supplemental to the day employment. Modification of such provisions is impossible. On the other hand, discretion is given the Board about other matters not defined or regulated by the Act upon which it must make decisions in the discharge of its responsibility. The Board is specifically required, for example, to approve the minimum qualifications of teachers of trade, home economics and industrial subjects, which it is willing to accept in a State plan. When the proposal was made by at least one State that the Federal moneys be used for the purpose of giving instruction to backward, deficient, incorrigible or otherwise subnormal individuals, the Federal board refused to approve, and in the exercise of its discretion ruled that it was the intent of the Act to provide through vocational instruction "for healthy, normal individuals to the end that they may be prepared for profitable and efficient employment." The following table shows the principal standards which the law has established for schools receiving Federal aid.

Mandatory provisions imperative—So far as the mandatory provisions listed below are concerned, the Federal board has, as has already been stated, no discretion in their observance. When

TABLE No. 13

Showing Mandatory and Discretionary Standards—Vocational Education Act

<i>Provisions</i>	<i>Agricultural Schools and Classes</i>	<i>Trade and Industrial Schools and Classes</i>
I. Mandatory provisions		
1. Public supervision and control..	Yes	Yes
2. Must fit for useful employment.	Yes	Yes
3. Instruction less than college grade	Yes	Yes
4. All pupils over 14 years of age..	Yes	Yes
5. Direct or supervised practice on a farm for at least six months per year	Yes	No
6. <i>All day instruction</i> —one-half time to practical work on a useful or productive basis.....	No	Yes
—instruction at least nine months per year—30 hours per week.....	No	Yes
7. <i>Part-time instruction</i>		
—pupils over 14 and under 18.....	No	Yes
—pupils already employed	No	Yes
—provide 144 hours of classroom instruction per year	No	Yes
8. <i>Evening instruction</i>		
—pupils over 16..	No	Yes
—supplemental to daily employment	No	Yes
II. Discretionary standards		
9. Necessary plant and equipment required as a minimum—determined by State Board—approved by Federal Board.....	Yes	Yes
10. Amount expended for maintenance required as a minimum—fixed by State Board—approved by Federal Board.....	Yes	Yes
11. Qualifications of teachers required as a minimum—determined by State Board—approved by Federal Board.....	Yes	Yes
12. Qualifications of supervisors and directors—required as a minimum—determined by State Board—approved by Federal Board.....	Yes	No

the legislature of any State accepted the proposal of cooperation with the National Government in the use of Federal funds for vocational education which is set forth in the Act, it specifically agreed to use these funds for the kind of vocational education provided in the Act and to carry out the standards and conditions for schools and classes as defined by Congress acting for the National Government. In designating or creating a State board of Vocational Education to administer these funds, the legislature charged this State board with the duty of using them in conformity to all the terms of the contract of cooperation between the Nation and the State which the legislature had accepted. Those who, for any reason, find fault with any of these mandatory standards have no quarrel with the Federal board or with the State board. Their recourse is either to appeal to Congress to change the Vocational Education Act, or to the State legislature to rescind its acceptance of the Act, a step which any State is entirely free to take at any regular or called meeting of its legislative body.

Discretionary standards as constructive safeguards—An examination of the discretionary standards for schools and classes shows that they deal with questions that could not be regulated by the Act in any definite or final or mandatory way. Yet they are all matters that needed to be safeguarded somehow. To permit Federal funds to be used by any school, or type of schools, which is unable to provide at least the minimum facilities necessary to successful training, spells failure and waste of effort and money, in advance, not to say anything about the discredit upon the whole movement sure to result. This is equally true whenever a school or class is established without the necessary funds for the proper maintenance of the work, including adequate salaries for competent teachers. As in every other form of education, the qualifications of instructors are the most important factor in the efficiency of all training schemes in vocational education.

Specific standards for all these matters could not, however, be defined in the Act for a number of reasons: 1. The requirements as to facilities and teachers vary widely in kind and grade as between the fields of agriculture, home economics and the trades and industries. 2. They also vary enormously in kind and grade as between occupations in the same field. 3. The number of occupations for which Federal moneys can be used under the Act is probably in excess of three thousand, no two of which present the same requirements as to plant, equipment, cost of maintenance or teachers. 4. The situation is further complicated by the fact that the training for many of these occupations differs in kind and grade according to the locality, the aims of the school and the experience and ability of its students. 5. The character and demands of many of these occupations is constantly changing with corresponding changes in the character of training and the standards of training. 6. New occupations are constantly arising not in existence when the law was drawn. 7. Occupational conditions and standards vary greatly from one locality to another. 8. Educational and economic conditions and standards vary greatly from State to State. 9. When the Act was passed, the States varied just as greatly in their status or condition of progress, some having well defined public systems of vocational education and some having virtually no work of this character within their borders. 10. Finally, allowance had to be made for the progress of States in their conception of the work and the development of their plans and, therefore, for a corresponding rise in their ideas as to what constitutes effective vocational training for different fields and groups.

Discretionary standards and the Federal board—Since these discretionary standards were necessary in order to insure the proper expenditure of Federal funds for the kind of vocational education which Congress and the Nation as a whole had in mind, it was necessary to lodge the responsibility for final decision somewhere regarding them. Naturally, this was given to the Federal board

as the agency charged with the responsibility for the administration of the Act. Congress left the board free to deal with the States in a cooperative and flexible way regarding these safeguards. This it has done in these ways:

1. Each State in its plan proposes or determines the minimum standards as to plant, equipment, maintenance cost and teachers for each type of school and class and occupation in which it plans to use Federal moneys.
2. In passing on these standards, the Federal board determines in its discretion whether these standards are the minimum which will insure satisfactory results in the use of Federal moneys for training.
3. The Federal board in making this decision deals with each State separately.
4. In this way, State and Federal board are free to set up only those requirements which are reasonable and workable under all the conditions to be met, including the state of progress in the development of vocational training which the State has reached.
5. As only minimum, not maximum, standards are established, the State board is left free to observe any and all higher requirements it desires or is able to put into effect successfully.
6. State boards can and do from time to time lift their minimum standards with the approval of the Federal board.

Right to standardize only activities where Federal moneys are used—In passing, attention should be called to the fact that while the Federal board is authorized and required to pass upon and approve the minimum qualifications for supervisors and directors of agricultural subjects proposed by a State, it has no such authority, so far as the qualifications are concerned, of similar officials for trade and industrial subjects. In short, the National Government has a voice in establishing standards for those managing and directing agricultural education, but not

for those managing or directing trade and industrial education. This distinction is made in the law solely for one reason. The fund for instruction in agricultural subjects can be applied to pay half the salary of a teacher or of a supervisor or director; that for trade and industrial subjects can only be used for the salaries of teachers. One of the fundamental principles of the law is that the National Government has the right to participate in the setting of standards for only those features of the work to which Federal moneys are applied. Since no part of the salary of State or local officials for industrial education is paid from Federal funds, the law very carefully refrains from giving the Federal board any voice whatever in determining their qualifications. This difficulty has been remedied to a small extent in the case of State supervisors of industrial schools who give a portion of their time to teacher training work. Inasmuch as a part of their salary can be paid from the teacher training fund, the qualifications they should possess for this phase of their service must be approved by the Federal board.

Vocational education vs. State and local policies—Failure, either to read the law carefully or to understand this basic principle, has led to a vigorous criticism of the Federal board in a recent publication on the ground that some State directors and supervisors of trade and industrial schools are incompetent and that the Federal board has failed to do its duty by permitting State boards to employ such officials. Undoubtedly, the work in some States has suffered and is suffering because of lack of capable, well-equipped leadership. So is general education for that matter. Favoritism, political preferment, partisanship and intrigue, absurd academic ideas as to what leadership in this new field demands—these are among the moving causes for the appointment and retention of local principals and assistant superintendents and directors and State directors and supervisors of industrial training unfit for the high demands of a new and exacting field of service.

The Federal board has no power to set any standards for these positions or to prevent the appointment of those utterly without the qualifications required for effective service, except in those cases where a State proposes to use a State supervisor or director as a teacher trainer also. Nor with the small force of field agents it possesses, can it visit and uncover the unsatisfactory results in local communities of this kind of State or local leadership. The responsibility rests squarely with the State boards of education. General and vocational education in backward States will improve only as these boards improve in personnel, in their sense of public duty, in their understanding of problems and conditions and in courage. It is not unfair here to say that the greatest single forward step will be made in any such State when the State Superintendent of Public Instruction becomes an appointive instead of an elective officer, and his office is taken entirely out of politics.

Results from the Vocational Education Act

Results from the Vocational Education Act can be best presented here by charts and diagrams taken from the Annual Report of the Federal Board for the fiscal year 1923-24.

The need and the size of the problem of vocational training is shown by the three diagrams which follow. The purpose of the Act was that of stimulating the States to undertake its solution through vocational schools and classes for those already employed and for those desiring preparation for employment. Since vocational education begins or should begin where general education finishes, the blocks and figures showing those out of school represent the group which Congress intended to aid the States in conserving.

Stimulating the states—When the Act was adopted (1917), there was very little vocational education of secondary grade outside a few states, such as Massachusetts, New York, Pennsylvania, Indiana and Wisconsin, in which State systems had

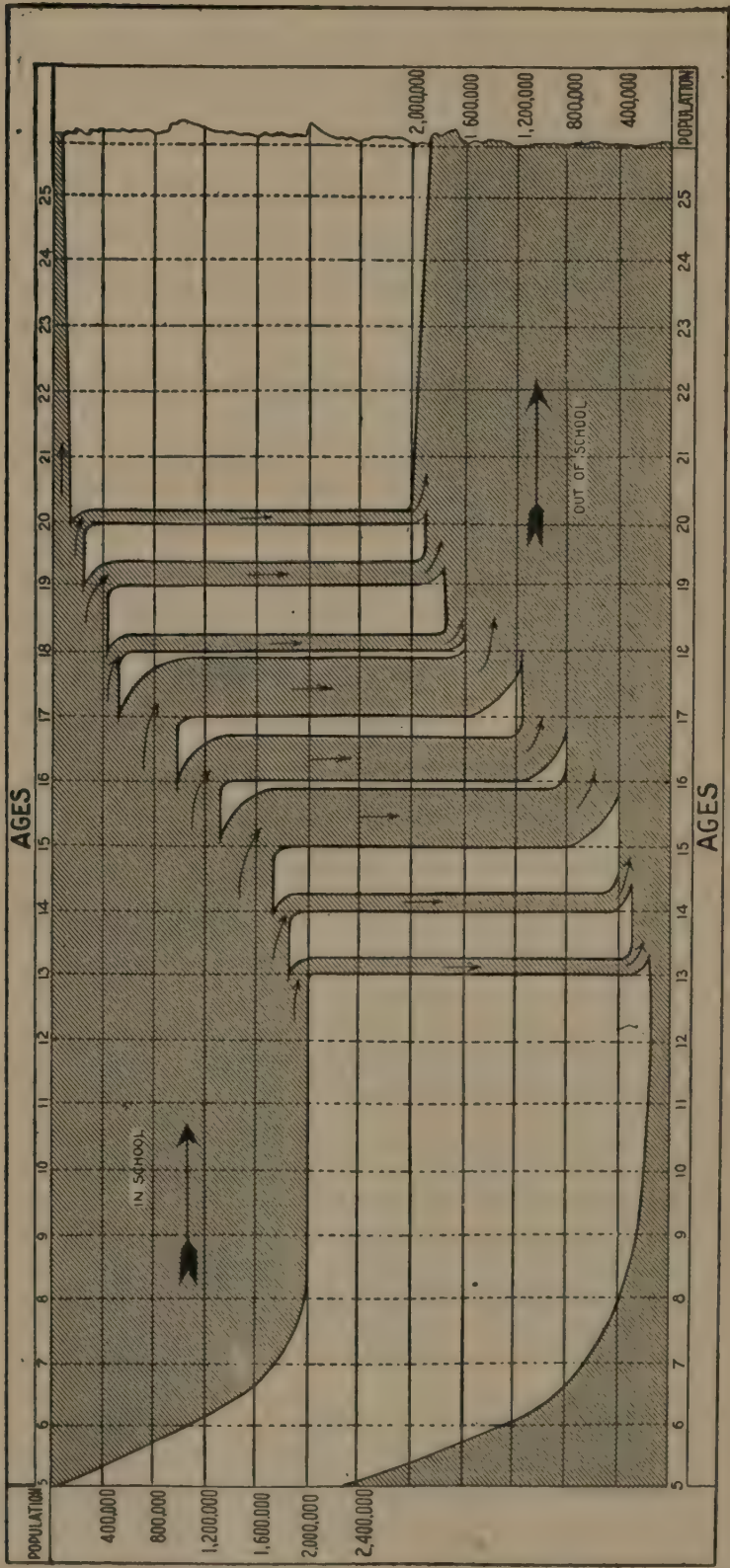


CHART No. 6
The Flow Sheet from School to Work

(Prepared by Mr. J. C. Wright, Director of Federal Board for Vocational Education, from address, How Can Labor and Education Be Most Satisfactorily Reconciled? Meeting of the National Society for Vocational Education, Buffalo, 1923.)

recently been established. The first step in all the States was to set up such a system. In almost all of them, state appropriations were made to supplement the Federal moneys and to assist local communities, usually to match the Federal dollar for teachers' salaries. As a result, in most Commonwealths, three funds are used to support approved local schools and classes, the local fund being applied generally to all costs of maintenance other than the salaries of vocational instructors. Chart No. 8 below shows

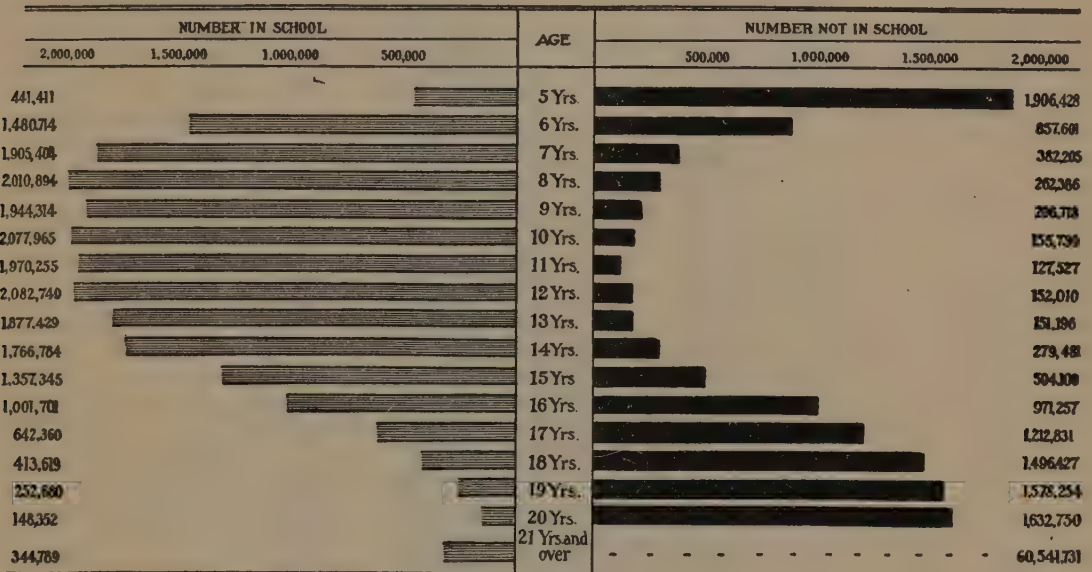


CHART No. 7

Numbers In and Out of School

by years the total expenditures from each of these funds for the operation of Federally aided schools. It does not include the outlay of local communities for site, plant or equipment.

The diagram shows the comparative amounts expended from each fund every year and the rapid and steady increase in the annual amounts contributed by States and local communities as the Federal allotments rose from year to year. In the first year the stimulus of Federal support induced them to expend more than \$2,000,000 and in the latest year reported almost \$13,000,000, an increase of over 500% during the period. While in the first year the Federal fund contributed 27% of the total amount

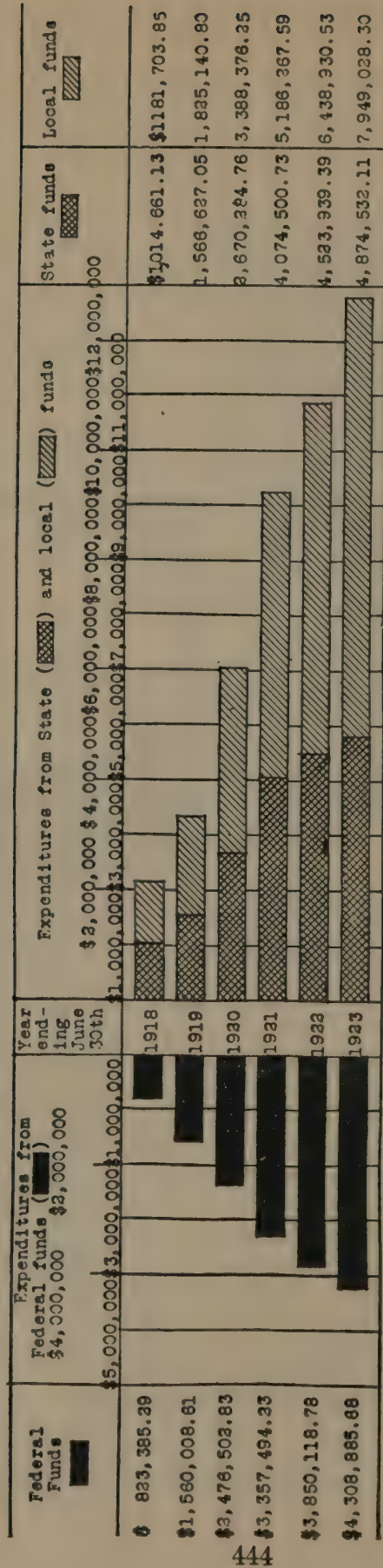


CHART No. 8

Showing by Years Total Expenditures from National, State and Local Funds for the Operation of Federally Aided Schools (1918-1923)

expended for operation, in the last year it contributed even with the rapid increase in the allotments to States only about 25%. While the Federal moneys used were five times as large in the last year as in the first, State moneys were almost five times as large, while the local funds rose to a total more than seven times as great as in the beginning year. This steady increase in State and local support over National aid is well shown in the charts below:—

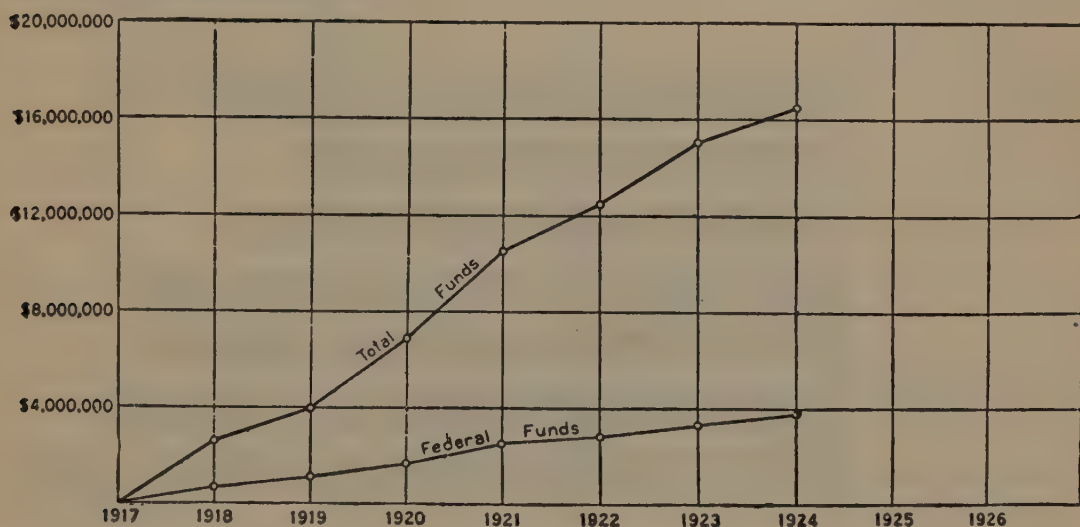


CHART No. 9

Showing Comparative Increase in Total Funds and National Funds Expended on Federally Aided Schools (1917-1924)

When the Federal allotments have reached their maximum in 1926-26, the amounts raised by State and local taxation will begin to exceed in a constantly rising proportion the assistance from the National treasury. This is what the Act was designed to accomplish. It is precisely what has happened as the result of the series of Acts beginning with the Merrill Act of 1861 by which Congress appropriated funds to the Land Grant Colleges of the States for agricultural education. In 1913 for every dollar of National subsidy used by these institutions the States expended twenty. In the past five years, the total amount expended for Federally aided schools by States and local communities has increased 500%, an average of 100% annually. On this

basis, the amount applied from these two sources alone in 1929 promises to be over \$60,000,000 which supplemented by \$7,000,000 from the National government would make about \$67,-000,000 available for the support of Federally aided schools. Obviously the Act has succeeded in stimulating the States to develop the work at their own and larger expense.

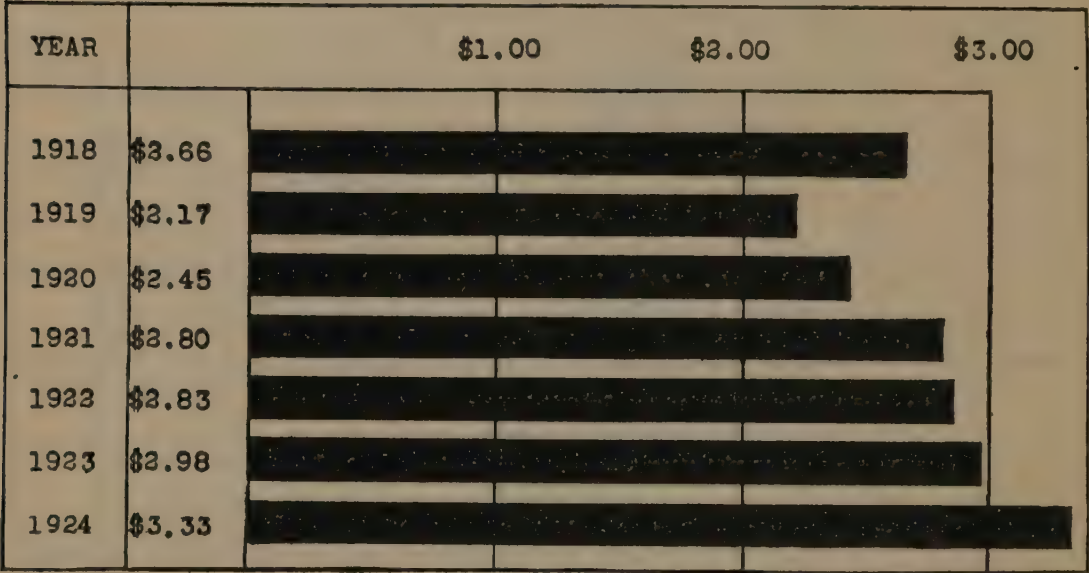


CHART No. 10

Showing for Each Dollar of Federal Money Expended by the States for Federally Aided Schools—The Total Amount Expended by the States from all Sources on Such Schools

Promoting schools and service—How well the task of establishing centers of training and reaching those needing training has been discharged by the State Boards in their use of State and Federal moneys is shown very conclusively by the following charts. In the short period of five years since the beginning year of the work, the number of schools has become more than three times as large, the number of teachers almost three times as great, while the number of students enrolled had risen in 1923 to a figure almost 3½ times that of 1918.

Preparing teachers for the service—In the first year of the vocational Education Act, the States started teacher training

schemes in 94 institutions in which more than 500 teacher trainers gave instruction to more than 6,000 pupils, fitting them for service in vocational schools or giving them as teachers addi-

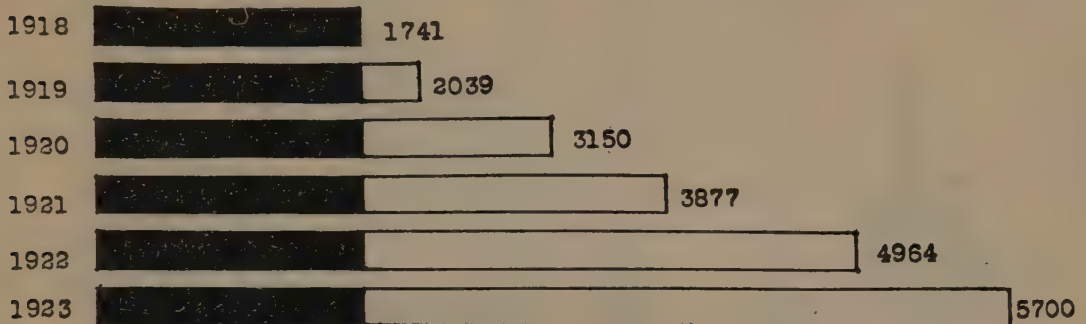


CHART No. 11

Showing Annual Increases in Number of Federally Aided Schools
(1918-1923)

tional preparation for service in which they were already engaged. In four years, the number of training institutions almost doubled, the number of teacher trainers more than doubled, while the number of pupils in teacher training courses tripled.

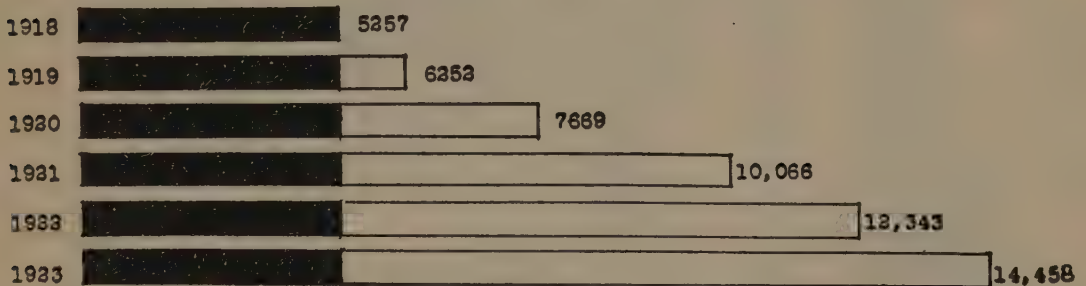


CHART No. 12

Showing Increases in Number of Teachers, Federally Aided Schools
(1918-1923)

Other far-reaching results—Without doubt, the impressive account of the stewardship of Federal and State boards in the use of Federal and State moneys just described shows that the Vocational Education Act has set forward the movement in the United States at least a quarter of a century. This is certainly

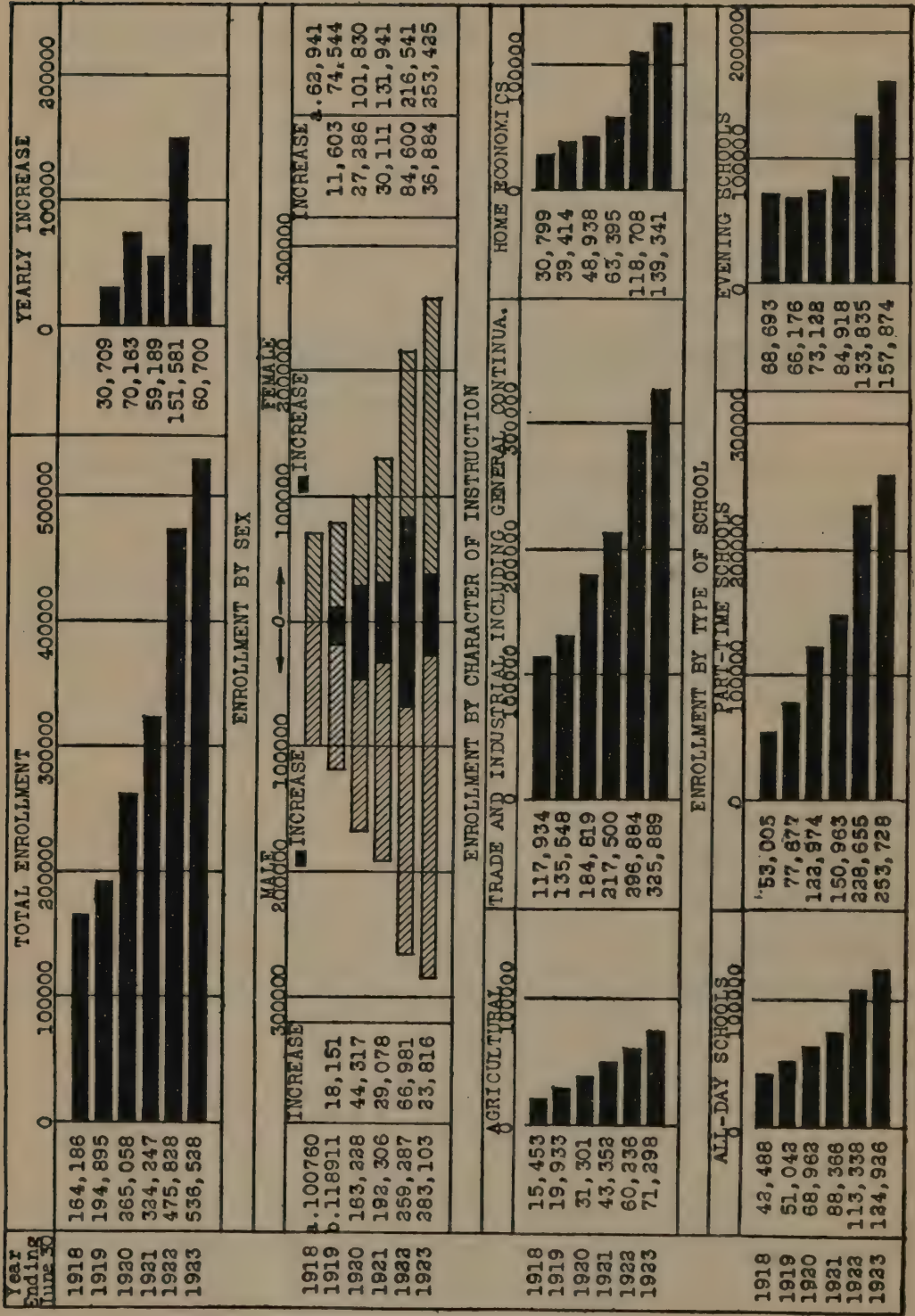


CHART No. 13
Showing Increase in Enrollment, Federally Aided Schools (1918-1923)

true with regard to financial support, the number of training centers and the numbers of persons served with this new educa-

1. In teacher training institutions

1918 ————— 94

1922 ————— 171

2. In teacher trainers

1918 ————— 524

1922 ————— 1235

3. In trainees

1918 [REDACTED] 6589

1922 [REDACTED] 18813

CHART No. 14

Showing Increase in Teacher Training Institutions, Trainors and Trainers
(1918-1922)

tional service. It is perhaps even more true about other and *still more important matters*:

1. All the States have established definite systems of vocational education for the promotion and establishment of vocational schools and classes and for the training of special teachers for service in them.
2. Virtually all the States have committed themselves permanently to a policy of special State aid for the work.
3. Following the cooperative plan with the States created by the Vocational Education Act, all the States have adopted State Vocational Acts establishing State and local cooperation or partnership between the States and the local community.
4. In this legislation the principle has been fixed of State approval of local vocational schools, as a necessary condition of State, as well as Federal, reimbursement of local expenditures.

5. In every State, approved minimum standards have been set up regarding facilities, maintenance costs, qualifications of teachers and courses and methods of instruction for every kind and type of local school or class maintained in the State.
6. In this way, what constitutes vocational education and what does not, has been clearly defined so far at least as the use of public funds for their support is concerned.
7. In all the States, many vocational schools and classes already observe standards higher than the minimum requirements for State and Federal aid.
8. The constant trend from year to year is toward a voluntary observance of better standards by local boards and therefore toward better work.
9. Taking the country as a whole, almost every conceivable kind and type of school or class has been established for each of many different occupations and for grades of training for occupations. This is equally true of courses of study and methods of instruction.
10. Equipped with many public and private vocational schools and classes and with many training schemes carried on by the occupations themselves, this country is today learning by experience what are the real vocational needs of workers in many different employments and how to meet them effectively—a huge national experiment which, while helping workers now, will teach us how to serve them better in the future.

The other side of the picture—On the average, Federally aided schools and classes have been in operation less than three years. Consequently, no reliable data exists by which to measure their effect upon the vocational careers of their students. It is probably safe to say that at least a decade from this writing must elapse before conclusive evidence will be available as to the re-

sults of their work. We are still in the promoting, establishing, experimenting, developing, improving, learning state. There is, of course, indisputable proof of the effective work done by some schools and all schools can furnish gratifying illustrations of the great help they have rendered individuals preparing for employment or for promotion and better wage.

For a long time to come, however, we shall, in passing judgment on Federally aided schools, be compelled to rely upon other than comprehensive statistics in order to determine whether the service rendered is efficient. Among these rough measures are all such things as the following: 1. The continued growth of the movement in financial support, number of centers and enrollment; 2. case proof of the benefits received by individuals and by groups of individuals; 3. the use, as standards of judgment in supervision, of well recognized factors of efficiency such as are set forth in the chapter on Efficiency Factors in Vocational Education; 4. the rising minimum standards and requirements enforced by State boards and the increasing conformity of local schools and classes to standards above these minimums; 5. improvement in the attitude of those engaged in the occupations immediately concerned toward local schools and classes—an improvement that manifests itself in more cordial support and more earnest and constructive cooperation.

When the statistics giving an account of their stewardships are finally gathered and analyzed, vocational schools and classes must submit without debate to the test they will apply. That test will be the extent to which these schools have accomplished their declared aim of fitting for successful wage-earning. There will be no escape from the evidence when it has once been compiled and fairly interpreted. It is this acid test sure to come that all schools need to realize and to plan for meeting as rapidly and as effectively as possible. The general schools have no such specific test to meet and in the very nature of their work could not meet such a test. Those of us engaged in vocational educa-

tion must meet it and if we believe in our cause and in the soundness of our ideas, should welcome it.

Any attempt to pass judgment now upon Federally aided schools and classes must take into consideration all such factors as: 1. the short time they have had to develop their plans and methods; 2. the large extent to which they must learn by experience; 3. the great extent to which their success depends upon the attitude and cooperation of employers and labor; and 4. the tremendous complexity and flux in the operations, demands and economic conditions of employments to which the vocational school must adapt itself. Most academic criticism shows an ignorance of these conditions that is both sublime and amazing!

At the present time, an application of the rough measures of efficiency stated above would in our opinion give us about this picture of the present situation. Under the given circumstances, many schools have done most excellent work, some of it very remarkable. The great body of these schools are doing what might be called a fair job with what they have attempted. Some, very much in the minority, while sorely needed, are doing very poor work. A few have no justification for their existence. On some of them, public money is being spent to large social advantage. On most of them, it is used to fair advantage. On some, money is being wasted without adequate social return. This same thing, however, could be said of the public school system of every State and of the work of every other public or private agency. The majority of these vocational schools are improving their service from year to year. Most heartening of all, a growing number are extending their service in the direction of true mass education.

Another way to describe the situation would be to compare it in the States with the condition of the regular public school system. Notwithstanding their comparative youth, we believe that taking them by and large, the vocational schools of most States at least are as a group more efficient in their work and in the

realization of their declared aims than are the elementary and secondary schools. We believe this to be equally true so far as college education is concerned. To the extent to which this statement is true, we are indebted to the more definite standards and closer supervision which Federal and State legislations have provided for vocational education.

Certain state and local weaknesses—Few readers of this will live long enough to see the complete development of efficient vocational education under public auspices or, for that matter, under private auspices either. The important thing now is that the movement is under way, and that taking the situation as a whole, we are moving in the right direction. We shall make progress toward desired goals as we gain knowledge and wisdom from experience in handling the difficult problems involved. That progress is today being hampered by certain tendencies or weaknesses among which these will be easily recognized by those familiar with the situation:

1. A tendency in some places to make vocational schools and classes solely a dumping ground for defectives and delinquents.
2. A tendency in other places to make vocational training a minor part of the general course in education that prepares for more schooling and for college credits.
3. A tendency in other places to make both the mistakes just described.
4. An overweening desire by some local school authorities to have a Smith-Hughes School or Department and have the use of Federal and State moneys, which often leads them to establish vocational courses which are not feasible, do not meet required standards or cannot be successfully maintained.
5. The transfer and use in vocational instruction of the traditional organization, procedures, content and methods of regular education.

6. A tendency to focus local effort in some communities entirely upon the training of males to the neglect of females; and in others, upon females to the neglect of males.
7. A tendency to confine vocational work to small groups of adolescents who have not yet gone to work and to a limited number of trades and employments; and almost completely to neglect all youth and adults already employed as wage-earners.
8. The utter isolation of some school officials and their vocational ventures from the occupations and trades of the community, particularly from those for which they are attempting to train young people.
9. Failure of some States and some local communities to provide adequate funds for the effective promotion, establishment, equipment, maintenance, supervision and expansion of the work.
10. The lack of capable, well prepared and experienced leaders in some States and communities, who have the vision, knowledge, resourcefulness and courage which the task requires.
11. The lack of competent teachers having adequate trade experience, technical knowledge and teaching ability.
12. As the most serious and far-reaching weakness of all, the inefficiency of some teacher training institutions, State and local leaders are being prepared through instruction given them almost entirely by teacher trainers who have had no experience whatever in either the teaching or the supervision of vocational schools or subjects and some of whom do not in reality "know what it is all about."
13. This is no less true of the efforts of such institutions to prepare instructors of practical and related vocational subjects.

Changes in the basic vocational education act—It is most significant that in the seven years that have elapsed since the adop-

tion of the Act, only one real attempt has been made to amend it in any way. This has been done by what is commonly known as the Fess bill sponsored by Senator Fess while Chairman of the House Committee on Education. This bill which has already been favorably considered by this Committee during the last two sessions of Congress will again be before the next Congress. It was proposed by the Federal board and has received the hearty support of almost all the women's organizations of the country. It amends the basic law by divorcing the provisions for home economics from its present, almost hopeless entanglement with trade and industrial subjects, and by providing separate appropriations and separate standards for training in home making.

Just before the adoption of the basic Act in 1917, the words "home economics" were by a parliamentary maneuver inserted between the words "trade and industrial" in every section of the measure applying to "trade and industrial subjects" so that all the provisions of these sections now apply to "trade, home economics and industrial subjects." No modification whatever was made in the provisions of these sections as to standards and requirements for trade and industrial subjects. As a result, home economics education under the Act has been administered for seven years under mandatory regulations well designed for trade and industrial schools but entirely unadapted to home making subjects, a situation which has greatly handicapped the promotion and the efficiency of the movement for Federally aided departments and classes in home making subjects. As no additional appropriation was made to compensate for the introduction of an additional field of vocational education into the law, trade and industrial education has been required to share its fund with home economics education. This has deprived the former of the same or equal support as agricultural education which was planned in the original bill and given the latter funds entirely inadequate to meet the growing demand for the training of homemakers, particularly through extension classes for those already

employed in homes and in wage-earning pursuits. For these reasons, there is a pressing need for the adoption of the Fess bill at the earliest possible moment. This will remedy the one glaring and irreconcilable difficulty faced by State and Federal administration of the present Act.

If, at any time, any general revision or codification of the Vocational Act became necessary, a situation altogether unlikely in the immediate future, we believe that the following minor changes or improvements should at the same time be made: 1. The appropriation of \$200,000 annually for the administration expenses of the Federal Board should be increased so that the Board may have the funds with which to carry on more extensively and intensively all such constructive activities as: the study of occupational demands on workers; the establishment of the teaching content for occupations; the preparation of outlines and teaching material for occupations; and the publication of analyses, illustrative job and information sheets and helpful handbook material for a wide range of home economics, commercial and agricultural subjects, and particularly of trade and industrial subjects. 2. Up to a small minimum, the fund for the salaries of teachers of trade and industrial subjects should be made available in each State for the payment of a part of the salary of directors and supervisors of these subjects. 3. Following the same policy as with agricultural subjects, the law should at the same time require State boards to propose for the approval of the Federal Board minimum qualifications for all such officials whose salary is paid in part from Federal moneys. 4. In the agricultural States in which the Federal allotment for trade and industrial subjects is not expended for such subjects, it should be made available for use by such States to pay the salaries of instructors in farm mechanics subjects in agricultural schools and classes. 5. The present restriction should be removed so as to permit Federal support of special part time classes operating for less than 144 hours per year—so as to leave local communi-

ties free to use Federal moneys on any approved part time class meeting a real need of workers—regardless of its length.

Opposition to the Federal Program

Judged by the usual standards by which we measure popular opinion in a democracy, there is very little political opposition to the Vocational Education Act and the work of the Federal Board in its administration. Not only was the measure adopted by an almost unanimous vote, but on repeated occasions since its enactment, Congress has shown the same favorable attitude. In this, it reflects the endorsement of vocational education and the policy of Federal support for it set forth in the platforms of virtually every National party since 1908. The truth is that opposition to the Federal program for vocational education is confined to a comparatively small number of citizens, most of whom are professional educators. Wherever the issue has been presented to the layman in any definite way, the movement for practical education has been given an unqualified endorsement. Undoubtedly, much of this support comes from a deep-seated sense of fair play—a conviction that the public school systems of the country are entitled to a fair chance in the development of a new educational service. Whether this support continues depends, not upon political manœuvering, but entirely upon how public educators discharge the responsibility.

The minority opposition to the Federal subsidy of vocational schools and classes is made up of a number of small groups of citizens having widely differing motives for their attitudes. In any rough classification, we may recognize at least these groups: 1. Those who are opposed to all vocational education of secondary grade at least; 2. those who are opposed to vocational education at public expense at least; 3. possibly a few State and local boards and officials who have not succeeded in using the Federal money with a free hand or for some pet scheme not authorized by the act; 4. some persons paying a large Federal

income tax who perhaps, naturally, tend to oppose any avoidable Federal expenditures including appropriations to the States for any purpose; 5. a few political leaders in a few of the wealthier States who oppose Federal appropriations to the States for any purpose because the citizens living within the States they represent pay more income tax to the National Government proportionately than these States receive back in allotments from the Federal treasury; 6. the great foundations of the country, particularly the Carnegie Foundation and the General Education Board who have from its inception opposed the whole movement for vocational education and particularly of Federal aid, on the ground that the National Government would unduly influence the actions of the States in the conduct of their educational affairs, something which these foundations evidently regard as being a threatened interference with their prerogative; 7. some very sincere believers in State rights who oppose all Federal cooperation with the States in the use of Federal money for State purposes as being an unwarranted extension of the functions of the National Government and an indirect interference with the sovereignty of the several States; 8. a group of regular educators who regard the Vocational Education Act as being a threatening or dangerous or sinister step in government and in education because "it has given the National Government a dominance over the States in their conduct of vocational training"; 9. those who believe the Good Roads Act, the Agricultural Extension Act, the Maternity Act and the Vocational Education Act to be unconstitutional.

Only the issues raised by the last two groups will be discussed here. All the other issues have either been met in other chapters or will be considered in connection with the following discussion.

The question of the constitutionality of Federal aid—No legal steps have ever been brought directly to test the constitutionality of the Vocational Education Act. With one exception, this is

also true of all the other basic acts by which the Federal Government has authorized the annual appropriation of funds to be used by the States for different educational or social purposes. That sole exception is the Maternity Act. This Act established a Federal Board of Maternity and allots one million dollars annually to the States for the partial support of approved schemes that are maintained by States for the better protection of mothers during childbirth.

In 1922, Mr. Allen, the Attorney-General of Massachusetts, acting under the instructions of the General Court of that State and in behalf of that State brought a suit in the Supreme Court of the United States against the Federal Board of Maternity and the Secretary of the Treasury. His purpose was to test the Constitutionality of the Maternity Act. The Supreme Court was petitioned to restrain the Maternity Board and the Secretary of the Treasury from expending any of the funds, or performing any of the acts provided for in the Law. The basis of this petition was the contention of Mr. Allen that the Law is unconstitutional and violates the sovereign rights of Massachusetts and its citizens. Inasmuch as this was a suit by a State against officials of the National Government, a motion for leave to file a bill of complaint was made by Mr. Allen, in order to secure permission from the Supreme Court to have such a suit tried before that body. An analysis of the complaint filed by Massachusetts shows that, while it attacks the Maternity Act directly, it also indirectly attacks all the Acts making appropriations to the States; that every ground on which the constitutionality of the Maternity Act is attacked is equally applicable to all these other Acts; and that, if the petition against the Maternity Act were sustained, a similar petition would be sustained against similar measures including the Vocational Education Act.

The Supreme Court denied the motion for leave to file this bill of complaint and in so doing made it impossible for Massachusetts to press its suit. The action was taken in an opinion in

which the Court said, "We have reached the conclusion that the case must be disposed of for want of jurisdiction without considering the merits of the questions."

About the same time, certain citizens of the State of Massachusetts brought suit in the U. S. District Court for the District of Columbia petitioning that body to enjoin the Maternity Board and the Secretary of the Treasury from performing the duties with which they are charged under the Maternity Act. This suit was promptly dismissed by that Court on the ground that it had no jurisdiction over the matter, that jurisdiction resting with the Supreme Court alone. Inasmuch as the latter dismissed the complaint as to the constitutionality of the Maternity Act, it is probable that the constitutionality of all similar Acts has been at least indirectly established by the highest tribunal in the land, at least the attempt to establish their unconstitutionality has "died a bornin'."

Nevertheless it is an issue that may sometime be raised in some form with regard to the Vocational Education Act, and that, when raised, will fail of its purpose as certainly as did the attack on the Maternity Act. The proposed bill now pending, providing for a Secretary of Education and appropriating money to the States for use in public schools, involves the same issue. For these reasons, the reader is strongly urged to study an article on the Massachusetts Attack on Federal Aid which was written by one of the authors and which was printed in the February number of the Vocational Education Magazine for 1923. In it the reader will find the arguments for the constitutionality of Federal grants, particularly for vocational education, so fully set forth that they need no repetition here. They may briefly be summarized in these statements:

The Vocational Education Act like all the other National Grants to the States is constitutional for these reasons:

1. The National Government has the constitutional right to appropriate moneys for any purpose not forbidden by the Con-

stitution and to enter into any contractual arrangement with the States not so forbidden. 2. The States have the constitutional right to accept and use moneys from any source including the National Government for any purpose not forbidden by the Constitution and to enter into any contractual arrangement with any individual or entity, including the National Government, not so forbidden. 3. Nowhere does the Constitution either directly or indirectly forbid any of the actions performed by either the Federal or the State governments in the enactment and execution of the Vocational Education Act or, for that matter, of any of the other Acts making grants to the States for any purpose. 4. The principles of all this legislation have been firmly established by sixty years of precedent undisturbed by any adverse action of the Courts. They will continue to be undisturbed.

The question of Federal influence or interference—The ghost of the unconstitutionality of Federal appropriations to the States for desirable National and Social ends has probably been laid for all time to come. Only a very few thinking persons have ever really believed it. Most of those who have raised the issue voiced only their hopes. In general, whatever sincere opposition to the Vocational Education Act on its merits still exists is based, not on a belief that it is illegal, but that it is unwise. This would be equally true of all the other basic Acts, from appropriations to Land Grant Colleges to those for good roads. Jealous of the prerogatives of the States and sincerely convinced that we shall as a people make sound progress in the development of all matters left to the States by the Constitution only as the States are left free to work out their own destiny, a small group of citizens, chiefly educators, in every State “view with alarm” the Federal legislation for vocational schools just as some social workers view with alarm the Maternity Act and doubtless some State Highway Departments, the Good Roads Act.

They regret or oppose the Vocational Education Act because they fear that under its provisions, the National Government will

both directly and indirectly influence or interfere with the State autonomy in the development of vocational training. They admit that all experience shows the more rapid development within the States of every State enterprise which has been encouraged by Federal funds. Some of them view with equanimity or little regret Federal appropriations for good roads, for better maternity care and for various enterprises conducted by the State through its Agricultural and Mechanical Colleges. They fear or resent the Vocational Education Act, however, because of its actual or potential interference with the local public school systems of the State. Along with this there sometimes goes a deal of foolish talk about the schools as the "palladium of our liberties." Many of them sincerely believe that it would be better to delay educational progress along vocational lines for decades rather than to secure the doubtful progress of "Federally aided," "influenced," "dominated," or "controlled" training.

Most of those not opposed in principle to vocational training at public expense would, however, be willing to accept grants to the States for this or any other kind of education if the States were left free from all regulations in their expenditures. They ignore or fail to understand the recognized policies in Federal Legislation for vocational education which this country has through Congress developed or evolved in the last sixty years. This evolution is well described in the Report of the Federal Board for Vocational Education, 1918:

"The Vocational Education Act is the culmination of an evolution in national appropriations for vocational education. National grants for education in America were made in the early part of the last century. These early grants were given to the States for no specific purpose, without restrictions, without administrative machinery, and without the establishment of safeguards in the expenditure of the money. As might have been expected, the funds, in part, were dissipated, and little, if any, results were gained. Beginning, however, with the Morrill Act

of 1862, the Federal Government has, by a series of acts, the second Morrill Act, the Nelson amendment, the Hatch Act, the Adams Act, the Smith-Lever Act, and the Vocational Education Act gradually found its way to a philosophy and policy in the use of national money for vocational purposes—it might better be said for vocational educational purposes—since all of this money has been given for the stimulation and support of vocational training.

“Each one of these acts has represented an advancement on the part of the National Government in dealing with the problem. Each act has included provisions which made the work more systematic and effective. The Morrill Act imposed but few conditions in the use of the money by the States. The Smith-Lever Act imposed many conditions. It is safe to say that the Vocational Education Act is the most specific and exacting of all these enactments in its requirements upon the States in the use of Federal money.

“In the sweep of almost a century since the early grants were made by the National Government, we have passed from the idea of the use of the Federal money for indefinite educational purposes to the use of Federal money for very specific educational purposes carefully defined in the statute. We have passed from the idea of no obligation on the part of the State in the expenditure of the Federal money to the conception of a solemn obligation on the part of the State to use the money in conformity with the requirements of the law making the appropriation; from the idea of no machinery, no system, and no organization to safeguard and administer the funds to the idea of a definite system, a thoroughgoing organization and careful safeguards in order that the Federal money may be spent effectively for the purposes intended.”

Social principles in Federal aid—This National policy regarding State subsidies has not been developed in the field of vocational education alone but has been applied to all enterprises

for which Federal appropriations have been made. The Maternity Act, for example, specifically defines the purposes for which the Federal moneys may be used and requires the State Maternity Board to submit its plans, approved by the Federal Maternity Board. In the Good Roads Act, the plans and specifications for each specific road building enterprise in any State must be approved by the Secretary of Agriculture—a degree of control not provided by any of the Acts for vocational education. The objection to the participation of the National Government in defining and standardizing the kind of vocational education for which Federal funds may be used, is, therefore, opposition to a consistent trend and policy to which that Government has definitely committed itself for more than three decades. That policy rests upon at least these principles and considerations:

1. All the Federal subsidies to the States made before the Civil War were given for general or indefinite purposes and without restriction or regulation.
2. The records show that some of the States wasted all, or a large part of, these funds in various enterprises, some of which were certainly never contemplated by Congress.
3. In the first year of the Civil War, Congress entered upon a new policy in making grants to the States, most of whom had passed the crude pioneer stage in their development—a policy which beginning with the Morrill Act has increasingly embodied the following principles:
4. Federal moneys are raised by National taxation for National purposes and therefore belong exclusively to the National Government.
5. None of these moneys belong to any State as of right.
6. Congress has the full and exclusive right to expend these moneys for any purpose which it regards as being helpful to the National welfare not forbidden by the Constitution.

7. Long years of precedent and the decisions of the Courts have established the right of Congress to appropriate funds to the States for State enterprises which Congress believes it advisable to stimulate and support, one of which is vocational training of both collegiate and secondary grade.
8. Having abandoned long since the policy of appropriations to the States for general or indefinite purposes, it becomes the duty of Congress to safeguard the Federal funds allotted to the States by defining the specific purpose for which Federal moneys may be expended and regulating the conditions under which they may be used.
9. For the same reason, Congress must define and regulate the appropriations made to Federal departments and bureaus—it can do no less, in its stewardship of Federal moneys, with regard to funds granted to the States for any purpose.
10. Recognizing the sovereignty of the States under the Constitution and their right to control and operate their own enterprises reserved to them by the Constitution, the Federal government can go no further in its proffer of Federal funds to them for any enterprise than to propose a cooperation or partnership with the States in their use.
11. Each State is entirely free to refuse to enter into this cooperative agreement, and is also free to withdraw from it at any time, without any formalities as to previous notice.
12. Should any State not be interested in developing for its citizenship the enterprise which Congress decides to stimulate, it should and will decline the offer of cooperation; should it be opposed to Federal subsidies in principle, it can likewise decline; should it object to the terms of the cooperative partnership, proposed for any particular enterprise, it can also decline to participate; should it find the partnership unsatisfactory, it may at any time discontinue it.
13. Every State that ratifies the cooperative agreement, however, accepts it as a contract whose terms are to be observed by

both the Federal government and the State, as long as the latter chooses to continue the arrangement.

14. The State still remains entirely free to carry on the same enterprise in any way it sees fit, as long as it does not use Federal moneys for its support; and to carry on the enterprise with the use of Federal moneys in any way it sees fit, as long as it does not violate the terms of agreement in the expenditure of this money, which are set up in the Act and agreed to by the State.
15. In any cooperative partnership between Nation and State for the use of Federal funds by the latter, the Nation as the nonresident partner invests money in a definite enterprise to be controlled and conducted by the State as the resident partner, according to the terms of the partnership defined in the Act.
16. In this partnership, it is the duty of the National Government as the nonresident partner acting through a Federal Board or other agency to which it has committed the responsibility, to see to it that moneys due the State for the joint enterprise are properly allotted and paid and that the State as the resident partner expends these moneys in conformity to the terms of the partnership agreement.
17. In this partnership, it is likewise the duty of the State, as the resident partner acting through a State Board or other agency for the purpose, to see to it that the nonresident partner performs his part of the agreement, and that all Federal moneys, used by the State for the enterprise, are expended in conformity to the terms of the partnership agreement.

Even a cursory study of the basic laws adopted since 1860, which make grants of money to the States for any purpose, will show an application in some form of all the foregoing principles and will show, furthermore, an increasingly definite and specific recognition of them in each succeeding Act. If defining the purposes and conditions under which Federal moneys may

be used by the State for a specific enterprise constitutes "an undue influence" or "interference" with a State in the conduct of its affairs, then it would seem as if Congress had definitely committed itself to a policy which makes such influence or interference unavoidable. Certain it is that any attempt to modify the Vocational Education Act, or any other existing basic Act, appropriating money for State enterprises, would receive little consideration from Congress, which removed the regulations defining the purpose for which the money is to be used and the conditions under which it may be used.

The N. E. A. bill—There is now pending before Congress, however, a measure commonly known as N. E. A. bill which provides grants of money to the States for use in a new field of Federal aid, that of general education, but which at the same time permits the States to use the Federal money with little or no regulation or restriction. One hundred million dollars is to be distributed among the States every year for use by their common school systems for such enterprises as removing illiteracy, health education, and the salaries of teachers. No terms are defined and no minimum standards established in the law, unless, perhaps, it be that no school is to be eligible for this Federal money which fails to hold at least a six months session. Nor are State Boards of Education required to submit for the approval of the Secretary of Education their plans for the expenditure of the Funds allotted to them. As its sponsors frankly admit, "the Bill provides a large Federal fund for the benefit of the regular schools but leaves the States almost entirely free to expend them in any way they see fit." In short, the bill makes the largest annual grant to the States that has ever been proposed, while at the same time it sets up less safeguards over the Federal funds than the Morrill Act of 1861. The bill is, therefore, in essence, a proposal to extend Federal subsidies to new fields, but to return to the policies governing their use by the States, which were practiced before the Civil War.

Many educators who are earnestly supporting this bill are just

as earnestly opposed to the Vocational Education Act because of the regulations in it which give the National Government "a dominance actual or theoretical over the educational affairs of the States." They want Federal money for general education, but as they themselves say, "We want it without strings." The writers believe as earnestly as they do in the need and wisdom of Federal aid for purposes of general education, and we believe it for the same reasons that lie back of Federal grants to vocational education. We believe, however, that Federal moneys for any purpose, educational or otherwise, should be appropriated for definite and specific purposes, rather than for general and indefinite purposes; that this purpose should be clearly defined in the Act; that the minimum standards, necessary to prevent the waste of Federal moneys in backward States, should be established in connection with the grant; and that all the vital conditions of cooperation between the Nation and the State should be specifically set forth in the Act. All these principles have not only been developed in our own National Economy, but, as Sidney and Beatrice Webb point out in their brochure on "Grants in Aid," England has adopted them as the result of three hundred years of experience with grants in aid from the Central to Local Governments.

The proposal to turn over Federal funds to the States virtually without restrictions is, in essence, a renewal of the contention before the Civil War that such funds, in a sense at least, belong to the States as of right. As a result of this contention, Congress did at one time distribute a surplus in the Federal Treasury among the States as a loan which they have never returned, or offered to return. The only ground on which this contention could be renewed is a very evident one: The National Government through its adoption of the Income Tax and the Inheritance Tax has indirectly deprived more of the States of these potent devices for raising the revenue sorely needed for public purposes, particularly for education. Some States now find it impossible

to adopt any State Income Tax or Inheritance Tax whatever, and others to secure any adequate ones. It is argued, therefore, that the Federal government should return to the States in some form at least a reasonable portion of the funds raised by these Federal taxes of which it has deprived the States. Admittedly there is considerable justice and force in this argument. Why not pitch the case for the N. E. A. bill on this argument and boldly insist upon this reimbursement of the States by the National Government through a substantial grant to general education entirely without restrictions? It would relieve many of the friends of Federal aid for the common schools from the embarrassment of supporting a bill which ostensibly defines but does not define; standardizes but does not standardize; and regulates but does not regulate!

Real vs. imaginary interference—In what way does the Vocational Education Act interfere with the States? It will be admitted at once that they are not coerced and cannot be coerced into accepting any partnership for the use of Federal moneys on a State enterprise. As sovereign States under the Constitution, they are entirely free to accept, reject or rescind the proposed agreement to cooperate. Taking the States as a whole they have already exercised all three of these privileges, as free contracting agencies. While no one contends that the States have been directly coerced into accepting the Vocational Education Act, objectors intimate that they have been indirectly influenced or forced to comply. This is the implied reasoning: Knowing or fearing that other States will accept the offer or cooperation in the use of Federal moneys, a State hastens to accept also lest it fail to have the same rights and benefits from Federal funds. In short, recognizing that some of these moneys have been contributed in the form of material taxes by its own citizens, every State is determined at all hazards to get as much of these moneys back as it can even though they are used for an enterprise which the State does not need or want; must be ex-

pending under regulations which the State disapproves; and requires in addition the expenditure of State and local funds far in excess of the Federal subsidy. This argument insults the intelligence of the States. Any State to whom the statements just made would apply is sadly in need of a guardian. Ergo, the guardian appears and proposes to protect it against the temptation of Federal aid and the disastrous results of Federal interference by repealing or modifying the Act. Would it not be just as efficacious to let such a State learn by sad experience the grave mistake it had made? When realized, the door is always open to withdraw from the spider web of Federal domination! It requires only the repeal by a State legislature of the law accepting the Federal Act and nothing more.

There is only one other way by which the Federal Government could "interfere" with the States and that would be through the unwarranted or unwise acts of its agent, the Federal Board for Vocational Education, which is charged with the administration of the Act. That Board has had a much more difficult task to perform than any other Board or agency responsible for a Federal subsidy to the States. Entirely aside from the inherent diversity and complexity and difficulty of the many problems involved in vocational education itself, the Federal Board faced from the outset two very delicate and critical administrative situations: One of these is the fact that the Federal funds allotted to the State must be expended by local public school systems. The other was that both State and local communities are and should be jealous of interference by the National Government with the conduct of these schools. The success of the Federal cooperation with the States depends on the way in which the Act and the Board met these two situations. No better statement of the principles and policies which have been established and unfailingly observed by the Federal Board under the Act can be made than that found in its Annual Report for 1918:

"The relationship of the Federal Government to the States,

as provided in the vocational education act, differs in a number of particulars from the relationship provided in the Morrill Act, the Nelson Act, the Hatch Act, and the Smith-Lever Act. In these four latter acts provision is made for the Federal Government to deal with a single institution in each State, with a few exceptions where two institutions were to be dealt with. It was necessary, therefore, in most States to deal with a single board of control for one institution and to expend the money in the affairs of one institution only.

"The vocational education act, appropriating money for the support of vocational education of secondary grade in agriculture, home economics, and industry, must needs deal with many institutions of many different kinds located in many different places—teacher-training institutions, institutions training adults in evening school, part time schools, day schools, schools located in rural communities, and institutions located in crowded cities. It was not possible for the Federal Government to deal with each one of these institutions directly, both because of the difficulty of the problem and because, traditionally, the elementary and secondary schools of the State are operated by the State itself. Any attempt on the part of the Federal Government to deal with them would be an interference with the autonomy of the State in the management of its own affairs. It became necessary, therefore, to establish, through the vocational education act, one State board of control for the administration of the Federal funds within each commonwealth.

"The establishment of a State board of control as a trustee of Federal moneys by the vocational education act makes it necessary that all schools, institutions, and classes within the State using the Federal money should deal not with the Federal Board for Vocational Education but with the State board charged with the duty and responsibility of expending these Federal funds in conformity with the act and a plan submitted by the State board and approved by the Federal Board.

“Under the plan of administration set up by the act the Federal Board has no dealings directly with any institution inside the State. It does not say that a scheme of teacher training shall be carried on by this, that, or the other school; it cannot say this, but it does pass upon the scheme for teacher training proposed by the State covering all such things as entrance requirements, length of course, content of course, method of instruction, and graduation requirements. It does pass upon the plan of vocational education proposed for the schools of a State, including plant and equipment, minimum for maintenance, course of study, and qualifications of teachers. When this plan has been approved it becomes the duty and responsibility of a State to select some institution or institutions inside the State to give the teacher training in conformity with the plan. It also becomes the duty and responsibility of the State board for vocational education to pass upon the question of whether or not certain schools have met the requirements of the act and the standards set up in the plan, and it is the duty of the Federal Board to see that the State board does carry out its plan of teacher training properly in the institution which has been selected and to see that the institution approved by the State board is in conformance with the plan proposed by the State.

“The Federal Board must inspect the work of classes, schools, and institutions, but not as schools, classes, or institutions. It inspects the work as the work of the State board being carried on by such classes, schools, or institutions. Should the State board fail to do this it becomes the duty of the Federal Board to withhold the allotments of Federal money for the ensuing fiscal year. The State board, therefore, takes the responsibility upon its shoulders of not only selecting and approving the schools in which the work is to be carried on but of seeing that these schools do carry on properly the work which they have undertaken to do with the expectation of receiving reimbursement from Federal funds.

"The Federal Board, therefore, is not concerned with controversies within a State as to what institutions or schools are chosen by the State board for carrying on the work. This matter rests entirely in the hands of the State board. The Federal Board is concerned only with the question of whether or not the State board is subletting the contract of vocational education and training vocational teachers as the work done according to the plan which it proposed and which the Federal Board approved.

"At the same time it is the duty of both the State and the Federal Boards to see that the Federal moneys are used in the most effective way possible and for the purposes set forth in the act."

A layman's explanation—This is a simple layman's explanation of the foregoing scheme of administration: "The Federal Board is the agent of a nonresident partner who allots moneys to a State Board as agent for the resident partner to be expended by him for a piece of work called vocational training. This work is done by the resident partner according to a general plan proposed by him and approved by the nonresident partner. This work must be done through local schools and is therefore sublet to local communities as sub-contractors. The Federal Board has relations only with the State Board and not with these local contractors. Its duty is to see that the State Board carries out the General Plan for doing the work. Local contractors have relations only with the State Board. Its duty is to see that they do the work effectively according to the Plan. Federal moneys flow to the resident partner as long as he lives up to his agreement as embodied in the Plan. Local communities are reimbursed by the resident partner as long as they carry on the work in a satisfactory way according to the Plan. Like the State itself, any local community is entirely free to establish, maintain or discontinue approved schools. Wherein lies the interference of the Federal Government with States and their public school systems?

"No demand has developed in the States for a change of the board's administrative interpretations of the act. The explanation of this general acceptance by the States of the board's ruling is very simple. No rulings by the board have been at any time arbitrarily imposed upon the States. As formulated in the original statement and as subsequently developed and modified, the administrative policies of the board represent specific provisions of the vocational education act, and since this act has been officially accepted by all of the States, and has been thereby in effect made a part of the State laws, the policies defined in the act have been legally established in the States independently of Federal Board rulings.

"In the interpretation of these provisions the States themselves have participated freely, so that in a very real sense it is true that the administrative policies of the Federal board are in fact the administrative policies and interpretations of the State boards and their administrative staffs acting in cooperation with one another and with the Federal board under the vocational education act. With careful regard for the limits prescribed by Congress, the effort of the Federal board has been to set up such administrative policies as were most acceptable and advantageous to the States, and such as they themselves have favored and proposed.

"This policy of cooperating with the States in the formulation of its administration rulings under the act is perhaps the most fundamental policy set up by the board for its own guidance and procedure. With respect to those discretionary powers specifically reserved to it under the act, the board has consistently refused to dictate arbitrarily to the States. In every detail of its rulings it has, on the contrary, proceeded in full and open cooperation with State administrative agencies, giving consideration singly to what was conceived to be in the best interests of the States themselves. At the same time, in so far as it has been able to do so, the board has contributed elements of guidance and

leadership by promoting the development of our national program for public-school vocational education consistently with the accepted principles of education in a democracy, which require that such education shall be adapted to develop vocational efficiency as one important factor in good citizenship."

The Need for a Representative Administrative Board

The Vocational Education Act will never be declared unconstitutional and its repeal is almost as improbable. Far more imminent and critical from the standpoint of the welfare of the movement is the question as to whether a representative Federal Board is to be continued for its administration or the Board is to be abolished and its duties and responsibilities performed by some subordinate officer in a newly created Department of the Government. This is proposed in the N. E. A. bill providing for a new Department under a Secretary of Education into which all government subsidies and services for education of every kind are to be merged. It is also provided in another bill which has been proposed by the Efficiency and Economy Commission and which creates a new Department of Welfare and Education under a Secretary. In this department are to be placed all Government subsidies and services of every kind for social welfare, including education. It may be that before this book is in print some definite decision will be made by Congress concerning these bills and the many questions they involve. Nevertheless, no consideration of Federal legislation for vocational education would be complete which failed to consider on its merits the kind of administrative authority which will at the present time secure the most effective results from that legislation.

When Congress adopted the Vocational Education Act, it might have placed its administration in the hands of any one of a number of government agencies already in existence: the Bureau of Education, because the Act dealt with education; the Department of Agriculture, because it included agricultural training; the De-

partment of Labor, because it provided for the training of industrial workers; the Department of Commerce, because it concerned employers as well as Unions. Instead, the Act created a new and special Board composed of the Secretaries of each of these great Departments of our Government, the U. S. Commissioner of Education and three lay members representing agriculture, labor and employers respectively. Since the Secretaries of these Departments are always appointed from the special occupational groups which each Department is designed more particularly to serve, the Federal Board for Vocational Education always consists of two representatives of agriculture, two of employers, two of labor and the Commissioner of Education who is always an educator. This Board appoints a Director who carries out its policies and rulings.

The reasons which led Congress to create an independent and representative Board for the administration of the Act and which still make it necessary for this kind of a Board to be continued are set forth in a statement made by J. C. Wright before the Committee on Education, House of Representatives, Sixty-Eighth Congress, First Session, when the Hearings were held on the N. E. A. bill (H.R.3923) (see Bibliography at the close of this chapter). The following brief summary of that statement must suffice here to cover the case for the retention of the independent representative Board—a policy to which the writers most strongly subscribe.

When the Vocational Education Act was under consideration by Congress, all the plans proposed including that of the Commission on National Aid to Vocational Education were based on the two fundamental ideas of an independent board and one that would be representative of the parties in interest. To this policy, Congress subscribed unanimously when it adopted the Act in both houses without a dissenting vote and to it the President gave his hearty approval by immediately approving the measure. This conviction that a representative board was needed is justified by all such facts as the following:

1. The necessity for having a representative board to administer vocational education results from fundamental differences between vocational education and general education which are pointed out in the full statement given in the Appendix. (They have also been fully discussed throughout this book).
2. In general education, the questions which may arise are primarily concerned with administration from the standpoint of the efficiency of the work, or with the degree to which different groups have secured for themselves special advantages.
3. On the other hand, in the administration and development of vocational education, many situations must of necessity arise where conflicting group interests are involved and where it is highly important that wise policies be formulated, that wise decisions be made and that the program be developed so that all groups whose interests frequently conflict may have adequate opportunity for representation on the board of administration.
4. Even for the administration of general education within the States, the U. S. Bureau of Education has strongly recommended the representative board.
5. This policy has been very generally accepted and followed in the organization of State and local programs through the provision for representative State and local boards of education or through advisory councils.
6. Vocational education is so new that it is almost in the chrysalis stage, but already it has become evident that for it different procedures and different methods must be followed and different objectives set up from those which have been developed in the promotion of general education.
7. The time may come when vocational education will have reached the stage which general education has now attained and when the regular professional educators will be equally competent to work efficiently in both fields, but this time has not arrived.

8. To abolish the Federal Board which represents the various interests involved would result in placing the highest control of the work in the hands of those experienced in the general educative field only and would deprive those responsible for the administration of the work, of the advice and experience gained through contact with representatives of the interests they were trying to serve.
9. In view of the rapid development of vocational education and the many difficulties, problems and opportunities it faces, it would seem that the work of the Federal Board should be strengthened rather than subjected to the possibility of being submerged within a department or other bureau concerned primarily with the complex, widespread, numerous problems of general education.
10. It is likewise possible under such conditions that the administration would be controlled by an individual or group of individuals not in full sympathy with the kind of vocational education recommended by employers, labor and agricultural interests and the general public.
11. The conflicting interests involved in vocational education of different economic groups require for their adjustment a Bond in which labor, capital and agriculture are represented.
12. Because a most efficient and effective cooperation is required between vocational and general education, the Commissioner of Education was also placed in the Federal Board.
13. Quite aside from the question of the formulation and carrying out of policies which deal fairly with all conflicting interests, the inclusion in the controlling authority of individuals who, through successful experience, are thoroughly familiar with occupational demands and who can act in an advisory capacity, is highly necessary for the effective development and promotion of vocational education.
14. Under the present organization of the Vocational Education Act, the great economic groups of the country have, through

their representatives, a direct access to the source of control so far as the expenditure of Federal funds is concerned.

15. Obviously, the possibility of dealing wisely, fairly, and intelligently with situations which involve conflicting interests, or the possibility of direct access to a representative or the utilization of these representatives in an advisory capacity, would all be lost were the principle of a representative Board to be abandoned and the administration, promotion and development of vocational education absorbed in a department.

The conviction of Congress and the President that an independent Board was best for the administration of Federal aid to vocational education is justified by these facts and considerations:

1. The establishment of this Board followed the procedure usually followed by Congress in inaugurating new or experimental programs such as those placed in charge of the Interstate Commerce Commission, the Federal Reserve Board, the United States Shipping Board, the Panama Canal Commission, the United States Trade Commission, the Federal Trade Commission, the Civil Service Commission, and many other independent establishments.
2. In all of these cases, it was recognized that the situation was new; that quick action, great flexibility and special research would be required; and that the concentrated and individual attention of those responsible would have to be given to the task if it were to be successfully performed.
3. As this condition still exists in the field of vocational education, there would seem to be no more reason for the proposal to abolish the Federal Board at this time than to propose the abolishment of any other independent establishment or commission dealing with similar situations.
4. This is true, unless the whole theory upon which such Commissions and Boards have been established in the past is to

be repudiated, and there is to be brought about a fundamental and radical change in Government policy.

5. As organized, the Federal Board presents a most complete opportunity for cooperation with four agencies of the Government concerned with problems closely related to vocational education and for team play in research work and the dissemination of its results.
6. Vocational education is still in the pioneer and experimental stage. Neither in its methods, nor in its content, nor in its organization, nor in its fields for research is it yet standardized.
7. Its field covers practically all the people of the United States and its problem is to meet all their diversified needs for vocational training and to meet these needs in such a way that they can avail themselves most easily and completely of the service, and to serve all groups according to their needs without discrimination.
8. It will be many years before these problems can be worked out so that in organization, administrative and research, methods can be standardized.
9. Until the time comes, it is difficult to see how the work could be effectively carried on were its administration embedded as a relatively small unit in a large organization dealing with many and multifarious responsibilities.
10. Finally, the progress of Federally aided vocational education throughout the country evidences the success of the work which the Board has done in its administration of the Vocational Education Act.

The Future Relation of the National Government to Vocational Education in the States

The largest purpose of National grants for vocational education has already been served in stimulating the States to undertake the work. It is not likely that the Federal subsidy will be with-

drawn, but there is every probability that it will not be increased during the next decade, unless it be for home economics training—a probability previously discussed in this chapter.

The war has left us with a huge National debt to discharge. Our tax burden for this purpose and for the maintenance of existing Federal activities on their present basis, tends to keep Federal appropriations to the States for any purpose at present levels. The pressure for Government aid for other and new enterprises, such as health and education, will doubtless result in new expenditures in these directions, rather than in former ones.

A reaction from the expansion of Federal activities into new fields, during the war, has brought a pronounced tendency in many quarters to oppose the use of Federal moneys for State enterprises of any kind, however worthy. This situation has raised in more vigorous fashion the opposition of many interests in the more prosperous States against the whole idea of National grants, because they are made from funds contributed largely by such States, but are distributed to less prosperous States for enterprises which would be much cheaper for the former to maintain without Federal subsidy.

It is questionable whether any additional Federal grant is needed for stimulating the States to undertake vocational training of secondary grade in agriculture and industry. The time may come when the need for the same National stimulus for commercial education will be recognized and met. The States are already on their way with vocational training faster than we have necessary experience or knowledge successfully to conduct it.

Bearing out the history of all Government grants to Agricultural and Mechanical colleges, the impetus of the Federal support has already brought, in many of the States, a combined State and local expenditure for the maintenance of vocational schools, so much in excess of the sum received for their support from the Federal Treasury that, instead of a Federal dollar being used to match a State and local dollar, it is being used to match two or

three or even five such dollars. Instead of the Government aid being available "on a fifty-fifty basis," it is used, or soon will be, on a forty-sixty, thirty-seventy, twenty-eighty, ten-ninety basis. As the largest purpose of the Federal grant is to induce the States to undertake needed work on a large scale, it may safely be said that the National subsidy is in general accomplishing its purpose. As has already been pointed out in this chapter, however, there is immediate need for an amendment to the Vocational Education Act which will provide a separate appropriation, the amount asked for being \$1,000,000 annually for training in home economics subjects under regulations specially adapted to this work and for an increase in the appropriation for the administrative work of the Federal Board which will enable it better to discharge its responsibility for the National leadership of vocational education.

Federal and State cooperation in vocational training has during the past seven years passed through two distinct stages and is now entering a third. The first was what might be called the period of organization during which the Federal board and the State boards were establishing the machinery for discharging their joint responsibility, interpreting the standards and requirements for the work to be done and defining their administrative relationships and policies in dealing with each other. The second was the period of promoting favorable action by local communities and of establishing approved schools and classes. The third upon which we are now entering is the period for the constructive development and improvement of State and local systems of vocational training.

While all the duties and functions necessary to the administration of the Act and cooperation in their joint responsibility must still be performed by the Federal board and by State boards, the emphasis has now shifted from the details of administrative machinery and procedure to the intelligent study and more scientific handling of the many and difficult problems confronting the two agencies in their mutual task.

QUESTIONS AND POINTS FOR DISCUSSION

1. Study the history of National Grants to the States before the Civil War, all of which were made for more or less indefinite purposes and virtually without any restrictions on the States to safeguard the use of Federal moneys for the real purpose intended. What became of these funds? What social results did they accomplish? Would you favor a repetition of that experience?
2. Would you favor the allotment of Federal funds to the States for any kind of road the State authorities wanted to build, or do you believe that the National government should, in its cooperation with the States, require that such roads conform to such minimum specifications as will prevent the waste of Federal moneys. Why? If this is a sound policy for roads, why is it not sound also for vocational education? For general education? For agricultural extension work? For the administration of National funds under the Maternity Act?
3. Why not leave the States entirely free in their use of Federal funds, so that some may, if they will, build permanent roads while others build temporary ones? Apply your reasoning about this to the Vocational Education Act. The Vocational Re-education Act. The Agricultural Extension Act. The Maternity Act. The N. E. A. Bill.
4. Since under the Good Roads Act, any State may build any kind of road it wishes with its own money, and build as many of them and as often as it desires, in which way does the requirement that the roads on which a State uses Federal money must conform to minimum specifications approved by the U. S. Department of Agriculture constitute an interference with the autonomy of the State in the control of its own highways? Apply your reasoning to the contention of some educators that the Vocational Education Act is unjust or pernicious or unconstitutional because the Federal moneys cannot be used for Americanization work? For manual training? For school gardening? For technical high school instruction? For junior high schools? For the preparatory training of novices in occupations through the evening school?
5. A lives in Washington and B in any State Capital. They are mutually interested in getting some work done in the State. A proposes to B that the former contribute a certain part of the moneys necessary to get it done. A also submits certain minimum general specifications describing how it must be done if his money is to be used for the enterprise. When B accepts the proposal, A sends him annually the amount agreed upon as long as the work continues and B carries out his agreement. Is this an interference in any way with B? Apply the same

reasoning to cooperation between Federal and State Boards for Vocational Education in the use of Federal funds.

6. The work is to be done, however, all over B's state through local contractors as agencies. B proposes to them that they carry out the enterprise using as a large part of its cost, the funds supplied by A supplemented by those furnished by B. These funds are to be available as long as these local agencies or contractors C, D, E, F and the rest perform the work according to the plans and specifications upon which A and B have agreed as the basis of their cooperative effort. These local contractors accept the proposal. Does this arrangement constitute an interference by A with these contractors? Does it constitute one by B with them? Apply the same reasoning to the relations between State Boards for Vocational Education and local communities to the relations between the Federal Board and the same local communities.
7. Collect all the illustrations you can in your State of real interference by the Federal Board with the conduct of Federally aided vocational schools and classes.
8. What are the minimum standards in your State for the qualifications of teachers of Federally aided agricultural education? Home economics education? Industrial and trade education? Do you regard these as being efficient in minimum requirements? Were they imposed by the Federal Board or proposed by your State Board?
9. Make an analysis of the plan and specifications in your State for Federally aided industrial and trade schools. For home economic schools and classes. For agricultural schools and classes. Would you change these? If so, in what way?
10. Set up the argument in support of Federal Aid to the States for purposes of general education in terms of these considerations:
 - a. The inequality in the wealth and taxing resources among the various States.
 - b. The mobility of our population.
 - c. The encroachment of the taxing policies of the National Government upon the taxing resources of the states.
 - d. The removal of illiteracy as a measure of national defense.
 - e. The need for a more intelligent citizenship in times of peace.
 - f. The vital interest of the National Government in the state of education among its people.
 - g. The need for minimum standards in knowledge and intelligence among all the peoples of a self-determining democracy.

BIBLIOGRAPHY

Grants in Aid. Sidney and Beatrice Webb. Longmans, Green & Co., New York.

A little book which sets forth very tersely the fundamental principles at which the English Government has arrived as a result of 300 years of experience in dealing with grants from the Central to local governments for various social purposes including education.

Report of the Commission on Federal Aid for Vocational Education. 2 vol. Government Printing Office. 1914.

Gives in terse form the arguments for National grants to the States for this purpose and sets forth the fundamental principles which the Commission believed should underlie legislation making appropriations to the States for vocational schools. Volume II gives an account of the hearings which the Commission held including the statements made by representatives of industry and agriculture for and against Federal Aid.

Annual Reports of the Federal Board for Vocational Education. 1918 to 1923 inclusive. Government Printing Office.

All these state with a wealth of illustration the principles on which the Vocational Education Act is based, the interpretation of the Act by the Board, their application to various situations and problems as they have arisen from year to year and the general policies adopted by the Board in the administration of the Act.

Policies of the Federal Board for Vocational Education. Bulletin No. 1. 1918. Revised 1922.

Sets up fundamental policies and by the question and answer method gives in detail the rulings of the Board both on general matters and those pertaining to each of the fields of agricultural, industrial and home economics education.

The Administration of Vocational Education. A. E. Payne. McGraw-Hill Book Company, New York.

A study, for a doctor's thesis, at Harvard, of the Vocational Education Act and the work of the Federal Board.

The War Work of Federally Aided Schools.

1. Bulletins 2 to 15—Federal Board for Vocational Education were prepared for use. Mechanics and technicians in training for war service,

the United States Shipping Board, the Army, the Navy, Federally aided schools and private schools.

2. Annual Report of Federal Board, 1919. Government Printing Office. Gives a statistical account of the war work accomplished by Federally aided schools. Peace work of Federal Board for Vocational Education. Bulletins 16 to 95 inclusive. Illustrate the large amount of helpful information and constructive suggestions furnished the States by the Board and the wide range of fields, subjects and problems.

Hearings before the Committee on Education, House of Representatives, First Session on H.R.3923. 1914. Government Printing Office.

These hearings were held on a bill to create a Department of Education to authorize appropriations for the conduct of said department, to authorize the appropriation of money to encourage the States in the support of education, and for other purposes. The report sets forth in full the argument at the hearings regarding these proposals. It also contains the case for the retention of the Federal Board for vocational education and a statement of the work and policies of the Board in the administration of the Vocational Education Act and the Vocational Re-education Act. (Page 639 ff.)

"The Massachusetts Attack on Federal Aid." C. A. Prosser. *Vocational Education Magazine*, February, 1923.

Gives a full discussion of almost every phase of the recent attacks made on the constitutionality and the wisdom of national grants to the States.

CHAPTER XVII

THE TRAINING OF TEACHERS FOR VOCATIONAL EDUCATION OF LESS THAN COLLEGE GRADE

As has already been pointed out in previous chapters, vocational education must, and, as a matter of fact, always does go on in some way. Organized vocational education is merely a social efficiency device to secure more effective training at less cost.

Vocational education, however conducted, requires teachers. A teacher is any one who assists a learner to acquire knowledge, skill and occupational intelligence. To put it in another way, a teacher is any one having instructional responsibilities. The fact that very frequently, as in the case of many foremen, workers, and even parents, the teacher is entirely unconscious of the fact that he has teaching responsibilities and is discharging them, does not alter the situation.

To the degree to which the teacher recognizes his teaching responsibilities, and is equipped to discharge them as efficiently as possible, vocational education, like any other form of education, is carried on with less wastage, less cost and less attempt to deal with unsuitable learners. Hence teaching is the most important element in securing the social results derived from efficient vocational education. Since these results have been fully discussed in other chapters they need not be repeated here.

Like any other occupation, teaching is, as one may prefer to call it, a profession, a trade or a "job." Training for teaching is vocational education just as much as training for medicine or boiler making. There exists a body of technical knowledge, of auxiliary information, and of what may be called the "tools" of

teaching; and there is the need for the intelligent application of this teaching equipment in actual practice. Like any other form of vocational education, a command of this equipment can be secured by pick up methods or through some form of organized training. In either case, to be of social value, there must be developed a doing or teaching ability and not merely information about how to teach or an appreciation of teaching or teaching methods. The socially valuable teacher must be able to teach, and teach efficiently. It is the sociological function of teacher training courses to promote desirable social ends—in this case, efficient vocational education—by providing such teachers. The degree to which any given training scheme can do this is the measure of its social value to the country.

It has seemed desirable, therefore, to include in this book this chapter on teacher training, confining it to training for service in vocational schools of less than college grade. As a matter of fact, however, so far as vocational education goes, these are the only vocational schools for which any organized training of teachers has been provided, at least, to any great extent.

The job to be done—Under the conditions described in the last paragraph, the success of vocational education evidently depends upon the possibility of providing instructors who, while they have a command of the special occupational content that they are to teach, are also trained in the special pedagogy and teaching technique required for this new form of educational work. This is the job to be done. The attempt to get it done in a satisfactory way has been one of the most serious educational problems that have arisen during the last ten years, and “the end is not yet.”

Before entering farther into the question of the training of vocational teachers, it will enable the reader to follow the discussion more clearly, if, at this point, we digress a little to consider the various plans for teacher training that have found acceptance and application. In general, all these plans may be referred to one of three types, each of which has found more or less application.

The three plans—If we designate occupational content by “C,” teaching equipment or “technique” by “T” and teaching efficiency by “E” we can represent the relations of these three variables by a sort of a formula as follows:

$$\begin{aligned} E &\propto C \cdot T \\ &\text{or} \\ E &\propto C \cdot T \\ &\text{or} \\ E &\propto C \times T \end{aligned}$$

Teaching efficiency depends upon the degree to which the instructor has a command of occupational content and of teaching technique. In proportion as his command of content is deficient, he fails because he does not know what to teach. In proportion as his teaching technique is poor, he fails because his learners either do not get that content or only get it with great difficulty and unnecessary expenditure of energy and time. The facts expressed in the preceding formula have gradually come to be recognized, at least in theory. As a result, in the attempt to apply them in practice, there have developed the typical plans described in the following paragraphs, which may for convenience be designated as plans A, B and C.

The first plan, Plan A. According to this plan, the teacher training agency undertakes to start with prospective teachers having neither “C” nor “T” and to give them both during the training period. An example of this occurs when an institution admits students who have had no experience in the trade of the machinist, and, in its class rooms and shops, gives training in that trade during the period of attendance. This is assumed to take care of “C.” During the training course “T” is also given. Theoretically, at least, an individual comes in with zero efficiency as a teacher and comes out with a degree of efficiency, “E,” assumed to be adequate for the needs of the teaching job.

Evidently, this plan will work only where the prospective teachers can attend instruction for a relatively long period since

the work must be given in residence courses. This is, and has been, the common plan for the training of manual training teachers in teacher training institutions. It will be evident that this plan must meet the cost of giving both "C" and "T." This is avoided in both the two plans yet to be described.

The second plan, Plan B. According to this plan, a group of prospective vocational teachers is secured made up of individuals who have already gained in some way training in the technique of teaching, but who do not possess the special occupational content of knowledge, skill and experience. From the standpoint of the job that they are to be trained to do, they know *how* to teach, but do not know *what* to teach. Teacher training, under these conditions, means giving them trade or occupational training so that they will possess the "what to teach." Reverting to the "formula," the purpose of the training course is to add "C" to a group already possessing "T" in order to secure "E."

Examples of the use of this plans are seen when grade teachers are transferred to positions in continuation schools and are given a special course in the special requirements of this new work. A certain hosiery mill used this plan to secure instructors by hiring a number of good teachers from the public schools and training them in the mill until they became expert machine operators. In this way, they learned the working conditions, and, what is more important, learned also to adapt themselves to these conditions so that they secured the "C" that went with the teaching job. We find the same thing illustrated when a high school instructor is assigned a subject with which he has no familiarity. On account of the demands of the schedule, for example, the teacher of science is asked to take a class in English, or in elementary French. In this case, however, he must secure his "C" by the pick up method.

Under this plan, however it may be worked out in practice, it will be noted that the cost of the training is only that of giving the occupational content. In some way, by virtue of previous

training at his own expense, or at the expense of somebody else, or by pick up methods, the prospective vocational teacher has, according to the theory of the plan, secured teaching ability. The teacher training course is under no expense as to this part of his equipment. The cost is exclusively that of giving him the vocational training necessary to make him occupationally competent. Hence it is less expensive than plan A.

The third plan, Plan C. According to this plan, the training course is given only to a group whose members have already secured adequate occupational experience. The course gives training in teaching technique only. In terms of the formula, people having "C" are given "T."

This plan has been used to a considerable extent in training trade and industrial instructors. The work has usually been carried on in evening classes so that the members of the class can continue to follow their regular occupations during the day. It has also been used to some extent in summer school courses and in all day meetings conducted for short periods of from one to several weeks. The training has frequently been given in short units drawn from the entire program, as described later in this chapter. In some cases, the work has been carried on through extension courses given by teacher training institutions, but more frequently through work conducted in various centers directly by State departments of vocational education. Evidently, the cost here is only that of giving "T." "C" has been in some way secured at no cost to the teacher training agency.

Characteristics of the different plans—For the convenience of the reader the more important characteristics of these three plans are given in the following table.

Efficiency factors in teacher training—Before taking up any discussion of these different plans, attention should be drawn to certain factors that affect the efficiency of any teacher training course. Among the most important of these are the following:

Proper selection. The group of prospective teachers must not only be possessed of the right natural qualifications, but they

TABLE No. 13
CHARACTERISTICS OF TEACHER TRAINING PLANS

	<i>Plan A</i>	<i>Plan B</i>	<i>Plan C</i>
Place.	Residential at the teacher training institution.	Residential at the teacher training institution or at the plant.	At any place where the work is easily accessible to prospective teachers.
Time required to complete the course.	Two to four years.	Depends upon time required to master the occupation. Up to four years in a highly skilled occupation or trade.	From 60 to 120 hours.
Content.	"C" and "T" in occupation to be taught.	"C" only in occupation to be taught.	"T" only.
Basis of group selection.	Acceptance of students on the basis of academic qualifications.	Selection on evidence of teaching ability in another field of education.	Selection on evidence of successful practice of the occupation to be taught.
Group from which selection is made.	The group usually entering institutions of the grade of the teacher training institution.	The group of successful academic teachers.	The group of trained and successful occupational workers.
Nature and amount of equipment required.	Production equipment of the occupation. Equipment for training in "T."	The occupational equipment.	The equipment for training in "T."
Equipment of Teacher Training Staff.	Must know both "C" and "T"; how to teach them, and how to teach others to teach them.	Must know how to teach "C" and how to teach others to teach "C."	Must know "T" and how to teach "T" to others.

must look forward to teaching. No matter how good a training course may be, if its product is individuals who either cannot successfully hold a teaching job, or who do not even become teachers, the course has failed in the service for which it was established.

Accessibility. Granting that a training course has established methods of selection that give a proper group, the course must be made accessible to that group, or it fails to function.

Cost. All other things being equal, the course that efficiently produces competent teachers at the least cost is the most efficient.

Adequate scope of training. The position of vocational teacher in any given field, or even in any given type of school, makes certain definite demands upon him. Some of these demands are immediate. Others are more deferred. All are demands, however, which the teacher must be able to meet if he is to be a success, and some of them, more particularly, in order that he may be able to hold his job. Any training plan is efficient in proportion as it turns out teachers trained to meet all the demands of the work, not some of them only.

Thorough training. Quite aside from the scope of the training just discussed, the work must be carried to a stage of doing ability sufficient to enable the instructor to make at least a reasonably fair showing on performance tests in teaching. If it fails to do this it is inefficient. Bearing these points in mind, we can now take up the relative advantages and disadvantages of these three different plans as measured against these efficiency factors.

The residential teacher training course (Plan A)—The essential characteristics of the various teacher training courses that come under the plan A classification are: the long term of instruction; and the practical necessity that the prospective teacher should live at, or close to, the training institution. They are, and must be, to all intents and purposes, residential courses.

These conditions automatically cut out from the possibility of

taking advantage of these courses those individuals, no matter how well equipped by nature or how desirous of becoming teachers, who cannot support themselves or be supported while in training. With rare exceptions, this means that occupationally competent people cannot take advantage of the course, if they are dependent upon the practice of their occupation for a livelihood. This is, perhaps, especially true of the competent mechanic, but it applies in general to all cases in all fields. As a result, the group who is able to take advantage of the course is composed almost entirely of young people of the type usually attending collegiate institutions. By very virtue of their youth they must be either wholly without occupational experience, or at the best, be without adequate experience. In fact, this plan is deliberately designed to meet the needs of such a group, since the ordinary academic admission conditions apply, and the course aims to give both "C" and "T."

That this plan has certain alleged advantages is undeniable. Assuming that the subject matter is of the right character, a point discussed later in this chapter, the plan offers the following points in its favor.

First. It deals with a group selected on the basis of ability to meet scholastic tests. In the view of most advocates of this plan, this means people of superior ability. Whether this is true, however, will be discussed later.

Second. The occupational training (C) being under the direct control of the institution, it can theoretically be given in the most efficient way.

Third. The content of the occupational training (C) can, theoretically, be made to conform to the most up to date practice and thus avoid the production of teachers who are not themselves occupationally up to date.

Fourth. This occupational training can be made complete, thus avoiding the production of teachers who are weak in some parts of the occupation that they will have to teach.

Fifth. It is also true that the "T" training can be absolutely controlled and can be made to include the latest practice in methods, the most recent developments in special pedagogy, and the most recent thinking and theories in the special occupational field in which the teacher must work.

Sixth. In theory, at least, the long period of training allows plenty of time for observation as to the intrinsic qualifications of students for teaching work, and so enables a selected group to be placed in the teaching service.

Over against these advantages, there are, however, certain disadvantages which seriously militate against the efficiency of the plan. Some of the more important of these are discussed in the following paragraphs.

Some disadvantages of the plan—Over against its advantages, many of them theoretical rather than actual, this plan embodies certain very vital disadvantages, which seriously interfere with its efficiency. Of these the following are of sufficient importance to warrant discussion here.

First. The plan, as just mentioned, virtually prevents the prospective teacher being drawn from the ranks of fully competent workers in occupations and trades. Consider, for example, the case of a successful machinist or auto mechanic or farmer. Such a man will have had from five to ten years' experience in the successful practice of his trade or occupation. He will be from twenty-five to thirty years of age. He will probably have acquired a family. Only in rare cases can such a man live on his savings or be supported by others while he attends a four, or even a two year, training course. For him, the plan is impossible. If a man of this type is the sort of individual who is required for an efficient teacher, in accordance with the principles set forth in the chapter on Efficiency Factors in Vocational Education, this plan will evidently not reach him and therefore will not serve to recruit him into the ranks of vocational teachers.

Second. This plan tends automatically to serve young people

who have not had the necessary occupational experience. It is true that we often find in these training courses young men of collegiate age who have worked in "dad's shop" or on "dad's farm" while attending high school, or who, during vacations, work in the occupation they expect to teach. Most of the prospective teachers in the agricultural training courses, for example, are boys who were brought up on a farm. Such experience, either in kind or degree, does not constitute adequate occupational experience, as defined in the chapter on Efficiency Factors, nor as contemplated in the National Vocational Education act and in State acts complimentary thereto. At most, such experiences represent only a portion of an apprenticeship training. This partial experience must therefore be supplemented by occupational training given in the institution, which is, of course, contemplated in the plan.

Third. If it is to give occupational mastery, this training, especially on the manipulative side (the "M" in the Richard's formula) must meet at least two conditions: There must be adequate time to give sufficient repetitive experience in operating processes and this experience must be given in the occupational environment. Admittedly, efficient methods of training will, as they unquestionably do, reduce the time required to turn out an occupationally competent person as compared with the time needed to turn out an equally competent individual trained by the pick up method. Nevertheless, for most skilled occupations, at least, this time requirement is considerable.

The worker who comes from a trade or other occupation to teach in a vocational school will have had four years of apprenticeship plus, let us say, at least four years more of practice in the trade. This means about forty hours a week for a total of about four hundred weeks, or sixteen thousand hours. Most teacher training schools following Plan A require less than 20 hours a week of shop work. They usually are in session for about thirty-five weeks per year. In four years a maximum of

2,800 hours of training in the occupation would be insured. This is about three-sixteenths of the time spent in learning a trade by a commercial worker. Making all possible allowance for summer work, for experiences gained at home and in the institutional shops and for the shortening of the time necessary for shop training because of the better organization of training experiences, the plan certainly does not promise efficient service in turning out teachers who are, in fact, masters of all their respective occupations.

When training in the occupational environment is given in institutional shops, it is generally admitted, by students of vocational education, that such experiences must be more or less pseudo and to that extent inefficient.

We have then several doubtful points about Plan A. It is, to say the least, likely to turn out teachers who are inadequately equipped occupationally and who do not come from the ranks of workers.

Realizing the truth of the facts just set forth, some attempts have been made to remedy the situation. Of these, the most interesting is the experiment in one State whereby a group of expert mechanics, carefully selected, on the basis of their trade proficiency and their personality, are being given a special two year training course by a State institution. During this period their support is secured by scholarships of two thousand dollars a year. The extra expense of this plan over all others amounts to about four thousand dollars per student, and, therefore, for each teacher produced. Where this expense can be met, we have a sample of the Plan A training course which offers great possibilities for sending out really thoroughly competent vocational teachers. Whether the expense will be prohibitive, or whether plans B or C will not be found equally efficient and less expensive, are points for further discussion.

Character of the curricula—In discussing Plan A so far, no mention has been made regarding the character of the curriculum.

It has been assumed that this is functioning adequately in equipping the prospective teacher to meet the demands of the job. This discussion could not properly be concluded without some reference to this matter.

The great majority of teacher training agencies that work under Plan A are either State agricultural and mechanical colleges, State universities, or engineering colleges. As an example of the type of curricula given in these institutions, the following is submitted, taken from Bulletin No. 62, Federal Board for Vocational Education.

TABLE No. 14
Showing Typical Curricula for Teacher Training

FIRST YEAR		
<i>First term</i>		
<i>Subject</i>	<i>Record.</i>	<i>Hours per week. Lab- oratory.</i>
Inorganic chemistry	3	—
Chemical laboratory	—	2
Freehand drawing	—	3
Rhetoric	3	—
Theme writing	1	—
Algebra	3	—
Psychology	3	—
Electives in shopwork.....	—	16
Military instruction	—	3
<i>Second term</i>		
Inorganic chemistry	3	—
Chemical laboratory	—	2
Elementary drawing	—	7
Rhetoric	3	—
Theme writing	1	—
History of industrial education.....	3	—
Sanitation and industrial hygiene.....	2	—
Military instruction	—	3
Electives in shopwork.....	—	16
SECOND YEAR		
<i>First term</i>		
Trigonometry	3	—
Industrial economics	2	—
Methods of industrial education.....	3	—
Drawing methods	2	—
Military instruction	—	3
Electives in shopwork.....	—	24

Second term

Practice teaching	—	4
Methods of industrial education.....	1	—
Reports on assigned readings.....	6	—
Shop organization	3	—
Electives in shopwork.....	—	24
Military instruction	—	3

At the time it was published in the bulletin (1920) this exact course was being given in the engineering department of a State university charged with the responsibility of training teachers for trade and industrial schools and classes. It differs so little from the courses offered by the engineering departments of other State universities that it may be fairly regarded as typical. An examination of the content of this course shows several interesting things which are tabulated below for the convenience of the reader:

TABLE No. 15
An Analysis of Typical Curricula for Teacher Training

Year	Content (C)	Teaching Equipment (T)
First	Electives in shopwork. 16 (Both terms)	Psychology 3
		History of industrial education.. 3
		Sanitation and industrial hygiene 2
Second	Electives in shopwork. 24 (Both terms)	Industrial economics 2
		Methods of industrial education. 3
		Drawing methods 2
		Practice teaching 4
		Methods of industrial education. 1
		Shop organization 3

The remainder of the subjects are those commonly given by engineering institutions in training courses for prospective engineers, and would have little or no value as equipment for teaching trades in the field of industrial education of less than college grade.

We have, therefore, assuming clock hours, and thirty weeks of class work per year, a content training of 1,200 hours of shop work and 345 hours of training for the profession of teaching, in-

cluding 60 hours of practice teaching. Other courses are evidently purely informational subjects.

Functioning of the curricula, the trade content—To any one familiar with such matters it is evident, at a glance, that the bulk of this course is the regular program for the first two years of an engineering college. It is a program for training engineers, not tradesmen. Such subjects as inorganic chemistry, trigonometry, and algebra can be dismissed with the statement that, at least as commonly taught, they are not functioning content for the prospective teacher of vocational education of less than college grade. Especially is this true when we remember that all students in this institution have presumably come via the high school or the preparatory school whose programs certainly cover sufficient basic mathematics to meet the needs of trade work.

From the standpoint of the shop work, we have 1,200 hours, which is about 15% of the time commonly required for apprenticeship alone. This would seem to be too much of a handicap in shop experience to be overcome, even if we assume extremely efficient instruction by the engineering staff, and, in addition, some experience in the trade secured in some way by the prospective teacher.

On the face of it, therefore, it would seem that this program could not produce teachers with actual occupational mastery. In addition, many of the subjects, such as shop organization and sanitation, are of doubtful value, in terms of the objective of the course. They are engineering rather than trade subjects.

Functioning of the curricula, the professional content—When we look at the provisions for training in the technique of teaching, we find a situation that is even worse. The University, whose curricula for training of trade and industrial teachers has just been discussed, has been charged by the State that supports it with the responsibility of equipping instructors for a field which is recognized as demanding more teaching skill under more varied working conditions than any other form of education.

Moreover, it is a field that has developed its own special methods and a pedagogy based on habit psychology rather than on faculty psychology. What has it offered to help prospective teachers in meeting these demands? Certain informational or "background" courses, such as the history of industrial education and industrial economics, are provided. Only three courses are given which can fairly be claimed to have a real connection with the development of teaching technique: Psychology, of doubtful value as commonly taught, occupies a total of 45 hours. "Methods in industrial education," require only 60 hours in the second year. Presumably "drawing methods," to which 30 hours are assigned, deal with instruction in drawing rather than ways to draw. All this is supplemented by about 60 hours of practice teaching. Only 9% of the student's time is applied to all subjects having to do even remotely with the problems of teaching and less than 6% of his time to all subjects having even ostensibly any real or vital connection with the pedagogy and methods of the industrial or trade school.

In this case again, the probability of turning out a qualified teacher seems extremely doubtful, especially when it is remembered that the student may have had some occupational experience, but so far as teaching technique is concerned is "grass green."

The difficulties as to segregated schools—In discussing efficiency factors that apply to the training of teachers, it was pointed out that only those persons should be trained who have the required native ability, who expect to go into teaching and who will remain in that employment for at least a reasonable time.

These requirements mean essentially a segregated group. This is another point where Plan A, as commonly conducted, "goes on the rocks." As already stated, this plan is commonly used by state universities and agricultural and mechanical colleges. Students attend these institutions, however, for a number of reasons other than a desire to teach. Many look forward to the practice

of some technical profession. Some expect to utilize their training in some productive occupation. Others attend for still different reasons. In many cases, such a student decides to take a teaching job only when he is about to finish his college work and finds that teaching is the best thing open.

Under these conditions it is practically impossible to secure a segregated group of those able and willing to learn and follow the occupation of a vocational teacher, because nobody knows as he progresses through the institution whether he is going to teach or not. This difficulty seems to be unavoidable, under the working conditions. It certainly interferes seriously with the efficiency of the plan as operated, although, theoretically, it has no bearing upon it. Should such an institution undertake from the start to establish definitely segregated classes for prospective teachers and provide for them a special program, it is doubtful whether students could be secured in any number, or if the situation at graduation would be improved.

Summary—While different institutions vary greatly, it may safely be said that most programs for training vocational teachers will show any or all of the following weaknesses:

First, as to selection. Like any other occupation the training of recruits for teaching requires the formation of a selected group. Under the present methods of enrolling students in most teacher training courses, this is not common.

Second, as to content. The content of these training courses rarely presents objectives and experiences that agree with all the demands of the teaching job.

Third, as to recruiting for the business. In at least many cases, these institutions are but little concerned as to whether graduates from their training courses go into teaching, or, if they do become instructors, whether they continue as teachers for a reasonable length of time.

In short, the wastage is large, the equipment for training is poor, and the selected group, so far as selection is based upon the

requirements for becoming a good teacher when trained, is usually entirely lacking.

The fault here lies with the attitude of the institution as a whole, rather than with the teacher trainers. In many cases, these teacher trainers are keenly alive to the situation, but are not in a position to deal with it due to the conservative attitude of the college authorities who are their superiors. The foregoing statements are not made in a spirit of destructive criticism. Many training institutions have already recognized, more or less, the inadequacy of their present training programs and are taking steps to improve them along the lines suggested here. Unfortunately, many others have not yet "seen the light." The statements here are made for the purpose of setting before the reader the situation, preliminary to a further and somewhat detailed discussion of the problems of teacher training in the vocational field.

How such curricula come about—If the reader has agreed with the preceding statements and conclusions, the question will naturally be raised as to how such non-functioning curricula come about. The answer is not far to seek. It is found in what may be called the standard procedure of curriculum building practiced by most of our higher institutions of learning.

The standard procedure is, in essence, one of assembling. When the institution is faced with the need for discharging a new responsibility through a new course of study, the natural procedure is to provide the subject matter by simply making a new combination of courses already given in the college. This is what happened in many cases when State universities or A and M colleges were designated as teacher training agencies for the new field of vocational training. They endeavored, as best they could, to utilize the faculty members and courses already in existence. The sample course given shows plainly that it is largely made up of courses that commonly go with engineering training, together with a few brief special courses in psychology and methods.

With regard to the faculty, the situation was much the same. The institution was reluctant to take on new men. Naturally, it turned to the professor of general education or of psychology for the "T" content of the training course. Incidentally, it should be mentioned that, in many cases, a person really knowing, as the result of his experiences as a vocational educator, the needs of a teacher of vocational education of less than college grade, would be regarded as ineligible as a teacher if he did not hold a master's or doctor's degree.

The difficulty, therefore, is essentially one of procedure in establishing curricula. Instead of ascertaining the actual needs of the teaching job for which students are to be trained and establishing a curriculum to equip them to meet these demands, the problem has been in many cases regarded as one of assembling existing courses and utilizing existing faculty members. Working under these limitations, it is not surprising that the results are so disappointing.

The very fact that such a procedure is "the easy way" when Plan A is operated in collegiate institutions, is another point against its social value in terms of the efficiency factors already discussed. It is a well known axiom in vocational education that when training is to be given for a specified occupation the first step is to determine the content of that occupation and then to provide the most efficient known devices for enabling a trainee to secure that content. The accepted procedure is to work from occupational demands to the building of the curriculum. The "assembling" procedure practiced by our colleges does not work in this way. It always proceeds from a survey of the resources of the institution to the curricula.

Whether or not the uncertainty as to whether they will follow the teaching trade, on the part of students, the need for economy, college politics, academic and scholarship traditions, unwillingness to look the facts in the face, intellectual laziness or any other of a score of possible reasons account for the situation, the result is

teacher training programs under Plan A which rarely function in terms of the special job demands which the teacher must satisfy after graduation and employment.

The selected example typical—The course of study we have been discussing was a two year course for training teachers for industrial education. It is, however, typical of the way in which Plan A has been worked out in all fields. An examination of training courses for teachers in home economics or in agriculture, whether two, three or four years in length, would reveal about the same conditions: much work of a general nature, such as is commonly given in an engineering course or in a liberal arts course; very limited provision for training in teaching; one or two methods courses of an informational character; and a few informational "background" courses. It would not be fair, however, to close this discussion without stating that, here and there, teacher training institutions are breaking away from tradition; are endeavoring to find out the real demands of the teacher's job; and are modifying their curricula to meet these requirements. The process of evolution is going on.

Plan B (get "T," give "C")—This plan has not been tried to any great extent in preparing teachers for vocational education. In at least one state it was used with success for preparing teachers drawn from the regular schools for work in continuation schools. It is also reported to have worked successfully in the case of one hosiery mill. Here, presumably, the jobs were machine tending and the time required to secure occupational mastery would be short. At present, therefore, this plan cannot be said to have been used sufficiently to warrant any great discussion as to its demonstrated efficiency or lack of efficiency. Certain inherent factors can, however, be presented.

This plan assumes that no further training in teaching technique is required. Experience with other plans, especially with Plan C, has almost invariably shown that the teacher, trained to work under general or academic school conditions, has much

to learn before he can do effective work in vocational education. As has been pointed out elsewhere, efficient vocational education must be based on habit psychology. Methods and teaching devices, aimed at doing ability, rather than the imparting of information, or drill on abstract subject matter, are distinctly different. Organization and working conditions are equally so. It would therefore appear probable that, were this plan to be tried out to any extent, prospective vocational instructors would be found to need about as much training in teaching technique as if they had had no teaching experience at all.

Beyond this, the attitude of mind of the general school teacher is usually different from that of the competent vocational instructor. Considerable training would therefore be required in the aims of vocational training, the conditions it must meet and the procedures and methods it must employ, otherwise a very carefully selected group would have to be secured. In the case of the hosiery mill a small number of prospective teachers was selected out of a large number of possible candidates, and the selection was made on such a basis. All of these points, and some others that could be mentioned, make it doubtful if this plan will ever be found efficient in practice, except, possibly, in some special cases.

Plan C (get "C," give "T")—By referring to the table in this chapter on the Characteristics of Plan A, B, and C, the reader will readily note the main features of this plan. Its success obviously depends upon the possibility of securing occupationally competent people who desire to become teachers and who have the intrinsic qualifications for that work. The degree to which this has been found possible has varied in the different fields of vocational education. Up to the present time, it has been done more successfully in trade and industrial education and less successfully in agricultural and home making vocational education. The reasons for this are discussed in that part of this chapter which deals with the training of teachers for special fields.

The plan, so far as theory goes, is simple. It permits the training work to be carried on wherever there may be a small group of suitably qualified workers who are interested in becoming teachers on either a full time or a part time basis, as in the case of teachers of evening trade extension courses. The cost is only that of training in the "T" values of the formula. This requires no expensive equipment and no residence during the training period. It deals only with a selected group composed of those who wish to teach and who have the capacity to become successful instructors. Group members can continue to follow their occupations while securing teacher training. Theoretically, therefore, this plan is free from those difficulties that have already been commented upon in connection with Plan A.

While, as already stated, the great bulk of teacher training is, at present, carried on through some form of Plan A, Plan C has commended itself to teacher training agencies in many states and is giving satisfactory results, especially in the training of trade and industrial teachers, and, in a few cases, of trade extension teachers for agricultural and home economics.

Constructing the curriculum for Plan C—Attention has already been drawn to the method of assembling old courses commonly followed in setting up curricula for Plan A. In contrast to this procedure, which would, of course, be equally applicable to this Plan (C), the actual method followed has been to study the difficulties encountered by, and the deficiencies shown by, occupationally competent people when they change their occupation from that of producer to that of teacher. The curriculum is, under Plan C, based upon the opportunity or service theory. A large amount of experience obtained in noting these difficulties and deficiencies has enabled a number of curricula to be made up which aim to correct them. As giving an idea of the scope of these curricula or courses, the following table will be of service, as indicating the additional assets that must be secured by a competent producer when he wishes to become a teacher.

TABLE No. 16

<i>The Competent Worker</i>	<i>The Vocational Teacher</i>
Knows his trade or occupation.	Knows the teaching trade.
Knows the occupational working conditions.	Can work under school working conditions.
Knows the occupational organization.	Can work under school organization. Knows how personal matters are handled in schools.
Has usually learned by the pick up method.	Teaches by organized instruction.
Thinks that because he knows his trade he can teach it.	Knows the difference.
Cannot visualize what he knows.	Can visualize content.
Knows how to plan production work to some extent.	Can plan instructional courses and teaching "jobs."

Other differences could be tabulated, but those given are enough to indicate the nature of the more common and striking differences between a workman and a competent vocational instructor.

The objective of Plan C is, therefore, merely to convert a good worker into a good teacher of workers or prospective workers. It is faced, in a sense, with a "patch up job" rather than with a "regular complete job." It aims to add only those additional assets that distinguish the good teacher of an occupation from the good practitioner of that occupation.

Character of the curriculum—The character of the curriculum for Plan C, or as it is commonly called, the "I T" course, depends, of course, upon the special situation. In general, however, it is drawn from a series of general objectives, or "blocks," almost every one of which represents as an aim some specific doing ability:

- I. The ability to visualize content "on demand"—that is, the ability, as required, to analyze the occupation or any of its operations and determine the things in skill or related knowledge that need to be taught the learner.

- II. The ability to carry on instructing processes, as used in vocational education.
- III. The ability to isolate teaching units—that is, the ability to break up the trade or occupations into distinct phases or units of operations and processes and related knowledge that need to be taught.
- IV. The ability to set up progressive courses of instruction—that is, the ability to organize courses of training in the way the learner can progress most successfully.
- V. The ability to deal with learners effectively under school conditions.
- VI. The ability to distinguish between vocational education and other forms of education.
- VII. An understanding of the economic and sociological functions of vocational education.
- VIII. A knowledge of legislation affecting the work of teachers, especially their work in State and Federally aided schools.

The special objectives in each of these blocks are set up to meet the known difficulties of the expert worker when he becomes a teacher. The program usually includes also provision for practice teaching under observation and criticism. This work lays special stress on the degree to which the best methods are applied by the student teacher to the special course he is teaching and to the characteristics of the group to be taught.

Functioning of the curriculum—Since the curriculum is made up from a comparison of the assets already possessed by the prospective teacher, as contrasted with the demands of the teaching job that he is to follow, the training can be made to function better than can any assembled course described in the discussion of Plan A. From the general content of such a curriculum, parts can be drawn to meet the situation when dealing with special groups, or in giving training for special teaching jobs. The work of the trade extension teacher, for example, is different in many

ways from that of a teacher in a full time day industrial school. In training teachers for trade extension work, the program can be made quite different from that for full time teachers. In fact, a relatively small amount of training in blocks II and III outlined above has been found quite adequate in many cases.

Plan C, therefore, offers distinct advantages over either of the other plans. It gives an elastic program. It can be made accessible to workers so that they can continue to practice their occupation while in training. It provides for an absolutely functioning content. The instructor can be any one competent to handle the work whether a college graduate, a foreman, a representative of a state department of vocational education or a personnel manager. The source of instructors is in no way restricted to the members of college faculties.

All of these are advantages not to be denied as compared with the other plans. As these advantages have become more and more evident, the use of this plan has spread. At present, it is the more generally used scheme for trade and industrial teacher training in a number of the states. For certain reasons, it has not, as yet, found as wide use in home economics and agricultural vocational education, a matter discussed in the latter part of this chapter.

Objections to Plan C—Various objections have been raised to this plan. These objections have commonly been based on some one of the following assumptions:

First. The course as laid out is concrete and direct, but it gives no training in fundamentals. Psychology, as such, is not mentioned. Men are simply shown, for example, that certain methods in teaching do succeed, and are, therefore, trained to use them. Naturally, such a procedure does not appeal to those persons who believe in basing a training course on the abstract presentation of "basic principles."

Second. Objection has been raised to the objectives of the course in that they are set up for the purpose of equipping com-

petent individuals, drawn from the occupations into teaching positions. This objection rests upon two assumptions: first, that teaching is exclusively the function of the scholar, and expert mechanics and other workers are not scholars, and second, that teaching calls for a higher grade of intelligence than is found in the group of people who are occupationally competent.

Third. Objection has been made to the short period of training (from sixty to one hundred hours), on the ground that it is not long enough to give any serious teaching equipment.

In some cases, of course, the animus lying at the bottom of these criticisms is merely the contempt of some college men for the worker. This phase of the matter can be dismissed without comment. In most cases, however, the objections have been based on a sincere doubt as to the possibility of doing, in a short time, with a group of workmen, usually relatively deficient in academic education, what admittedly is not often accomplished with college students in two to four year courses. When questions are raised from this angle, it is only fair that they should be discussed frankly.

The question of degree of academic education—Let it be assumed that we have, as teachers, thoroughly competent men and women so far as the occupational content goes. As vocational teachers, their job will be to transmit all or some portion of this content to learners. What is there in the program of a high school or college that will better equip them to do this? If they are able to speak and write the English language, the chief, almost the sole, means of communication between teacher and pupil, are they not fully equipped? Is a knowledge of German, ancient history, descriptive chemistry, or biology any additional asset for the job they have to do? As individuals, such additional education may possibly be an advantage for the enjoyment of leisure but is it to teach carpentry, or sheet metal work, or lino-type operating?

In laying stress on the value of a considerable degree of gen-

eral education, let us say beyond that of the elementary school, we seem to have as a result a certain confusion of thought about certain things which are assumed to come out of higher education, such as scholarship, social standing, superior mental capacity, social leadership, teaching as a pursuit belonging per se only to the academic scholar, and other assumptions of that nature.

Even the assumption that, of necessity, a man who has devoted from fifteen to twenty-five years of his time to secure a mastery of a trade instead of a higher education, must therefore possess none of the special attributes that are assumed to go with a college diploma, is not necessarily true. It has happened that both of us have associated considerably with mechanics and other workers. We have found many of them as well educated, in the real sense of the term, as many of the college graduates with whom we have also associated.

When we remember the numerous agencies through which a general education can be secured today, it is by no means surprising that men and women whose tastes run in that direction should have secured much general education through "irregular" channels, but should have nevertheless secured it.

The real facts of the case are that the stress laid in some quarters on the necessity for an advanced general education for the vocational teacher is not based so much on an analysis of the value of such education to the teacher as a teacher, as it is based on the general theory that any teacher must be an "educated man" in the sense in which this term is used by the "educated group." The preceding discussion should not be interpreted as meaning that we are not glad to see vocational teachers drawn from the group of those competent workers who have, in some way, secured more than the minimum of general education. We do, however, believe that, from the standpoint of securing an efficient instructor, the essential thing is thorough mastery of the occupation to be taught. After that, the more education the better. On the other hand, however, we do not believe that lack of advanced education of a general and cultural character should

bar competent workers from the opportunity to become vocational teachers. We believe, for example, that a certificating system, such as has existed in some states, which refuses to certificate anyone for vocational teaching who is not a high school or college graduate, as the case may be, is practically preventing the manning of its vocational schools with competent instructors, and is therefore fundamentally wrong, unjustly discriminating and inefficient.

The question of general qualifications—Another class of objections to Plan C appears to rest upon the fact that because it is made accessible to trade workers it will bring into the vocational schools persons who are undesirable personally. The following experience illustrates this attitude. One of the authors was asked by a representative of a collegiate institution to suggest somebody to take charge of the teacher training in that institution. When it was stated that there could be named several men, all of whom had done strikingly efficient work in this line, but that none of them held degrees, the reply was in essence, "The first thing that we must have is somebody who can get along on a social equality with the rest of the faculty." Needless to say, a man having these social qualities as evidenced by a degree but who was otherwise not qualified for the job was eventually selected.

It will be noted that this objection seems to be based on a conception of the skilled worker as one who of necessity possesses by virtue of his experiences in securing an occupational command, personal traits and habits that would be undesirable in a teacher. It seems also to be based on a conception of the worker as, of necessity, an individual who uses atrocious English, expectorates on the floor, dresses in some outlandish fashion—in short, who possesses none of the social habits or equipment that are assumed to be those of the typical general school teacher. On the contrary, the evidence of having passed through a period of advanced education is assumed to assure the possession of those habits and manners that are considered desirable.

Of course any sensible man of experience with the world knows

that neither belief is, as a general assumption, correct. There are many graduates of institutions of higher learning who, on a personal basis, would be undesirable as teachers and others who would be desirable. The same can be said of workers. In our contacts with workers, both of us have found many women and men who possessed all the desirable qualifications for teaching so far as personality, manners, language and standards of behavior go.

The difficulty here is in the assumption of class characteristics and the application of these characteristics to individuals. The imaginary characteristics of the school educated class are applied to all school educated individuals and the imaginary group characteristics of the working class are applied to all members of that class.

Experience with Plan C has shown that there is no difficulty in securing groups of individuals for teacher training who are entirely satisfactory for teaching positions, so far as both their ability as workmen and their personal qualifications are concerned. This means, of course, a selected group, but a selected group, there must be, no matter from what source the applicants for training may come.

As a matter of fact, the whole issue comes down largely to the traditional idea that the teacher must come from the "scholarly group" and that only scholars possess the personal attributes that go with the requirements of the teaching job. This conception has no basis in fact, but so long as it persists there will be objections or misgivings as to the value of any plan which proposes to make teacher training courses accessible to other groups than normal school, and college, graduates.

The question of intelligence—This discussion would not be complete without referring to another objection to Plan C. This objection is based essentially on the assumption that the sort of intelligence required for a vocational teacher is a different kind of intelligence from that required successfully to pursue

a vocation. This raises the whole question of general vs. specific applications of native intelligence in dealing with problems. Throwing aside the assumption that anybody who practices a trade is, *per se*, of a lower intrinsic intelligence than he who practices any other occupation—an assumption no thinking man would for a moment defend—we have two questions to answer: First, what sort of intelligence is required of a vocational teacher as a teacher? and second, what sort of intelligence must he give to his learners?

The first question can only be answered by empirical experience. Plan C has, up to this time, been applied by many teacher trainers to many thousands of occupationally competent men and women. A considerable amount of this training has been done in industrial organizations as well as in publicly controlled courses. The measure of their “teaching intelligence” would seem to be the ability of the trainees to grasp and apply in their teaching the principles of pedagogy and of psychology that constitute the material of the teacher training course. The testimony of almost all teacher trainers is to the effect that these occupationally competent or “trade trained” people, grasp and apply these professional points as well, and in many cases, better than the academically educated person. This has certainly been the experience of one of the authors in conducting courses where the group membership comprised both “trade trained” and academically trained people.

The second question can be easily answered by pointing out that the kind of intelligence which the learner must learn to use on the job is the same sort of intelligence that the teacher, as an expert worker, already possesses. Assuming for the sake of argument that there is an “academic intelligence” and a “trade intelligence,” evidently the academic intelligence is not the sort of intelligence that functions on productive work, and so has no value in vocational education. If all intelligences are the same in kind and it is a case of learning to use one’s intrinsic intelli-

gence in thinking with regard to specific problems, then the matter merely becomes one of kind of facts, kind of problems, and kind of decisions with which the individual learns by practice to deal efficiently, and the ability of the worker in his field is as great as that of the academic in his field.

In either case, the argument falls to the ground. It is only another manifestation of the traditional idea that scholarship, as represented by the product of the schools, always indicates higher intelligence than that found in those who have not gone to college. If we accept the modern theory of levels of intelligence, as discussed elsewhere in this book, our practical experience would scarcely lead us to believe that all the higher intelligences had concentrated themselves in the student body of the college. In fact, judging from the testimony of many colleges themselves, the opposite would seem to be true of a considerable portion of their student bodies.

In discussing Plan C, it must not be forgotten that this scheme can draw on the entire body of workers, in securing its selected group. If a certain degree of intrinsic intelligence is required, it can easily draw on intelligences of that grade among the working group. Up to this time, this has not been found difficult in conducting Plan C.

The question as to length of training period—An objection to the intensive training course of quite a different character from those discussed, is based on the relatively short length of the training period. Many persons accustomed to think of a course running from two to four years, fail to see how much can be accomplished in sixty to one hundred hours. This is a fair question and deserves a fair discussion.

In the first place, it must be remembered that all long courses are of the Plan A type. When we examine these long courses, we do not find much time given to the real problems, the pedagogy and the methods of vocational schools. If the reader will refer again to the typical training already given in this chapter to

illustrate Plan A, he will find that only about 350 hours of professional training are provided, including practice teaching. Of this, much is of informational rather than of practical value, as equipment for vocational teaching.

Moreover, as given by classes meeting only two or three hours each week, the work must of necessity be less efficient when the professional courses are scattered among other courses of a totally different character.

In the second place, the competent mechanic or skilled worker, strange as the fact may seem, usually knows a good deal about teaching. It must be remembered that some sort of teaching is going on all the time in occupations. The prospective teacher from the trade was taught by somebody and has, in most cases, taught somebody else, crudely, of course, but in general on the basis of habit psychology. In other words, occupations, in passing along the knowledge and skill from one generation of workers to another, have, by the method of trial and error, worked out methods of instruction that are psychologically sound. This is more than can be said of methods used all too frequently in many academic schools. This fact greatly aids the situation and enables the short course to give better results than would, to one not acquainted with the facts, appear possible.

A third fact is that, since vocational education deals largely with concrete material, the instructing conditions are simpler in their range than those that go with general educational work. Usable methods are fewer; type situations are of less variety; and interest is more easily aroused and maintained. All these things also make possible the giving of an adequate equipment in less time than might be considered possible by one familiar only with Plan A.

We have gone into considerable detail in discussing Plan C because we believe that it is the plan which will give the best equipped teachers to our vocational schools wherever it can be operated; and because it is not the one commonly in use at this

time. Much of the objections to it are based on academic prejudice, tradition and the inability of training institutions to see their real job and take steps to do it. As the problems of teacher training become more and more clearly defined, we believe that work of the C type, will more and more come into favor and will be incorporated into the teacher training program.

The three plans evaluated—The preceding discussions have indicated the chief characteristics of the three type plans for teacher training and the advantages and objections to each type. If we set up certain efficiency factors such as have already been suggested, it is possible to indicate, at least in a rough way, the degree to which each of these plans meets these efficiency factors. Of course, as in the case of some other comparisons in this book, the values given can only express the opinions of the writers, but, as such, they may be of at least suggestive interest. In the rating scale used, A represents the best and E the poorest standing.

TABLE No. 17

An Evaluation of Teacher Training Plans Against Certain Efficiency Factors

Factors used for evaluating plans A, B and C	Values		
	A	B	C
Accessibility to the occupationally trained group.....	A	E	D
Cost efficiency	E	B	A
Use of functioning content.....	D	A	A
Securing a properly selected group.....	E	C	A
Avoidance of long "cold storage" period.....	D	B	B
Securing thoroughly competent occupationally trained teachers	D	A	A
Feeding trained teachers into vocational teaching....	C	A	A

Pre-employment training vs. professional improvement—All plans considered so far have been discussed as pre-employment training devices. The function of the training scheme was to

give training to prospective teachers before they actually entered into the practice of teaching. As teacher training has evolved, however, there has come about modifications in all plans, but especially in Plan C, whereby the training for teaching is continued after employment as a teacher has been secured. This is, of course, a form of trade extension work in the teaching profession, and often takes the name of "professional improvement." As this idea has developed it has, of course, raised all sorts of questions as to the division of training between the pre-employment and the employed stage. This has, of course, seriously affected the value of the long term residential course, Plan A, and has also raised questions as to the best use of Plan C. For reasons already given, Plan B is omitted in the following discussion.

Professional improvement under Plan A—Professional improvement under Plan A has usually taken the form of summer courses or meetings running from one to several days. Under the working conditions, summer courses have only been possible where teachers were employed in day schools which closed for the usual summer vacation. Where the teacher's job covered all of the year, or where evening school teachers followed their regular occupation during the day, the summer course would of course be of little value. Hence, it offers a service only to a small group of employed teachers and fails to reach the great majority of teachers.

Two- or three-day meetings of the general character of "teacher's institutes" can be made to reach a somewhat larger group, but still do not reach the great mass of evening school teachers. As a matter of fact, the plan for professional improvement associated with Plan A meets the situation only when it deals with full time teachers employed in schools running on the same schedule as the regular public schools. In all other cases it fails to meet the situation with any degree of efficiency.

In considering any plan for professional improvement, it must not be forgotten that the efficiency of the plan depends on the

extent to which such professional improvement is needed, the extent to which the service is made accessible to all teachers, and the degree to which the content actually functions in meeting the specific needs of specific groups or of individual teachers.

Judged by these factors, the devices for professional improvement by summer courses or by occasional "conferences" or by institutes are not very efficient except under special working conditions.

Professional improvement under Plan C—In professional improvement under Plan C, the same elastic procedure that characterizes the pre-employment training has been continued. The work has been largely based upon individual needs. Where a number of teachers in the same locality have felt the same need, however, groups have been formed. The content of the training has been very elastic. For example, in one state following this plan, some teachers, as professional improvement, have gone back into their trade for the summer vacation. Others have formed groups during the school year for the further study of the teaching process and its methods. Still others have worked up special courses for some subject in their line. In other cases, evening courses have been given for five, ten or more nights, according to the special situation. In the case of trade extension teachers in evening schools, a few meetings have been held dealing with the "high lights" in teaching technique. In a few cases, correspondence instruction has been employed in dealing with isolated teachers. Itinerant teacher trainers have also been utilized to some extent.

The work has sometimes been carried on by representatives from the State office, sometimes by representatives of a teacher training institution and sometimes by local leaders trained for the service and working under the supervision of either the State office or of the training institution.

The general policy has been to give each teacher what will help him most on his job at the particular time that the professional improvement is offered.

THE TRAINING OF AGRICULTURAL TEACHERS

The preceding paragraphs have described the general objective of professional improvement and the way in which it is carried out in conjunction with Plans A and C. There is no question but that such professional improvement must form an integral part of any efficient teacher training plan or program. Just as no pre-employment training can completely equip an individual for any trade, so pre-employment teacher training cannot entirely equip a teacher for the practice of the teaching trade. Any training program that, figuratively speaking, pats the graduate on the back and sends him out "completely full" or "completely equipped" cannot be regarded as efficient in terms of the teacher training job. Of course this thought is entirely contrary to the traditional point of view of the college or university in other lines of education. More and more, however, institutions and State departments are seeing the fallacy of this old idea and are providing some means for a continuous "follow up" of vocational teachers. In proportion as this is done, the teacher training programs of the states will become more efficient.

In applying the theories and practices of teacher training in the fields of home making, of agriculture and of trade and industry, variations in working conditions have affected practice. This was to be expected. This discussion cannot, therefore, be properly closed without discussing the methods of teacher training used in these different fields.

The training of agricultural teachers—At present all agricultural teacher training is carried on in land grant colleges, of which there are forty-nine. Courses are of the Plan A type. With the exception of a few special subjects, the curriculum is the regular four year course leading to a bachelor's degree. Under most State plans, the possession of such a degree is a requirement for teaching vocational agriculture.

As in other cases where Plan A is used, no attempt is made

to segregate students looking forward to teaching from those looking forward to the practice of occupations in agriculture or related thereto. Professional training is represented by certain courses usually given in the senior year, though sometimes given, in part, during the junior year. It has already been pointed out why, under Plan A, segregation of prospective teachers is practically impossible, and that discussion need not be repeated here.

Occupational content—The Richard's formula applies in agriculture as well as in other occupational fields. In agricultural teacher training courses it is assumed, and is usually true, that students have been reared on farms and frequently work on farms during vacations, while taking the college course. This is assumed to give an adequate command of the operative processes in agriculture. The occupational content is, therefore, practically confined to technical knowledge and auxiliary information which would theoretically go with farm management and with the practice of different phases of agriculture.

This technical and auxiliary information does not, as a rule, differ in character from that which is given in the course for students who do not anticipate going into teaching, but who do expect to enter agricultural pursuits or closely related occupations.

Organization—The typical agricultural teacher training course in these institutions is an assembled course. In some cases the strictly professional training, such as professional methods courses, is given by a specialist who has been added to the faculty for that purpose.

Standard of measurement—The standards by which the social and economic value of agricultural teacher training is to be measured are the same as those by which training for any other professional occupation should be measured, and may be expressed in general by these questions:

1. How far do the objectives of the training course agree or compare with the demands of the teaching job?

2. To what degree are these objectives efficiently attained? .

3. To what degree do the specifications of the teaching job, as conceived by the teacher training authorities, agree with the purpose for which the teacher training course should be established and conducted, from the standpoint of its sociological and economic functions?

Range of objectives—With certain exceptions, which are discussed later, the objective of almost all teacher training courses is to equip prospective teachers to teach agricultural courses in high schools. This is not surprising, since, up to the present time, practically all vocational agricultural education of less than college grade has been given in high schools. While a number of promising experiments have been started, and a good deal of thought is now being given to agricultural education under different working conditions, the agricultural department of the high school still remains the standard agency for carrying out the objectives of agricultural education of less than college grade. If we accept for the time being this objective, what we have to consider is the degree to which these training courses would set up a presumption of furnishing adequately equipped agricultural teachers for high school agricultural departments. A comparison of courses, as offered in the land grant colleges, shows a very general uniformity of practice. The following statement can be readily verified by reference to the catalogue of any of these institutions. The curriculum will be found to consist of several groups of courses, as follows:

- a. A group of scientific courses.
- b. A group of technical courses.
- c. A group of humanistic courses.
- d. A group of professional courses.

The relative importance of these groups varies somewhat among the different institutions. The consensus of opinion recently secured from a group of teacher trainers was as follows:

- Scientific courses—25%.
- Technical courses—50%.
- Humanistic courses—15%.
- Professional courses—10%.

Discussion—We do not need to concern ourselves here with the humanistic courses. The scientific courses are of the usual type and are generally descriptive in character, including laboratory work usually of the conventional kind. The technical courses are generally given by the usual college methods of presentation—through lectures and the use of the text book. The professional courses usually consist of such general courses as psychology and, possibly, a historical course, together with one or more special methods courses and a certain amount of practice teaching. In addition there is often included a course dealing with the organization and administration of high schools.

It is evident that these courses reflect the traditional attitude of mind and standard machinery of the institution of college grade which is organized largely in conformity with the faculty psychology and the doctrine of formal discipline. This is shown in the large use of lectures and text book methods, in the presentation of much information and in the lack of the adequate training necessary to bring students up to a level of “doing” ability in the solution of concrete situations. The traditional idea that a command of content carries with it the ability to teach that content also appears in the relatively small emphasis laid upon professional training.

Granting that the objective of training solely to teach in a high school is an adequate objective, which, as will be shown later, is not the case, it is difficult to see how a young man who has pursued such a course is adequately trained. Some of the more important reasons for this statement are given in the following paragraph.

Agriculture consists of a large number of enterprises. The particular agricultural activities followed by any community are

affected largely by geographical and climatic conditions. These factors also affect operative procedure, the particular character of the technical knowledge needed, and the kind of training required for a group of students in the locality. Albert Lea, Minnesota, for example, is essentially a dairying community. A community, farther north in that State, which would be a wheat growing section, would be distinctly different. This fact is fully recognized. It is necessary, therefore, that the agricultural teacher be able to determine local community needs and be able to establish a curriculum which will give adequate training to meet local needs. Out of the whole range of technical knowledge, he must be able to select those particular items which function in the particular training course which he establishes. Consequently, he must be trained to analyze the needs of a community and to select functioning information for his training courses. This he will not be well equipped to do, unless he has been trained to work out problems of this kind in his teacher training experience. If, in the place of presenting to him a large and confusing body of mere facts, the prospective teacher could be taught a series of vital facts only so that he might learn to determine what sort of information was of value, he would be much better equipped for this phase of the work.

Many thoughtful students of vocational education now realize that general descriptive courses in science do not function efficiently in equipping an individual to apply science in an occupation. In practice, the particular applications of scientific facts to an occupation come up in concrete forms rather than as general principles. This appears to be as true in agriculture as elsewhere. The kind of scientific knowledge used and applied invariably consists of certain parts only of the science viewed as a whole. This is perhaps especially true of the chemical and biological sciences which function particularly in the agricultural field. If, in the place of general descriptive courses of the usual college type covering these sciences as a whole, there could be given the particular application of the parts of these sciences

which function in agricultural practice, the prospective teacher would be much better equipped for the work. For example, out of the whole range of chemical science the agriculturalist is concerned only with a few of the elements and a few of their compounds. Sodium, potash, nitrogen, oxygen, phosphorus, carbon, and hydrogen represent practically all of the elements with which he might have to deal, and with these he is only concerned directly as they appear in a small number of compounds. A knowledge of the properties and compounds of metals, for example, finds practically no place in agricultural practice. Could there be substituted for these general scientific courses training in securing and intelligently applying those parts of these sciences which function on the agricultural job, the prospective agricultural teacher would be much better equipped for his work.

The expert teacher is very much like the expert workman. Just as the expert workman has a kit of tools, and when he is faced with a given job picks out those tools which will enable him to do that particular job best with the material with which he has to work, so the expert teacher equipped with a "kit of tools," consisting of his knowledge, and command of methods, selects the devices which will enable him most efficiently to teach a given lesson with a given group of learners. This is entirely different from the mere theory of teaching. It is what may be called teaching technique. The ability intelligently to use these "tools" of the teaching trade is secured only through much repetitive practice. The expert teacher does not use one method or one teaching device. He uses many methods and many devices, even with different students in the same group.

Satisfactory training of this kind is provided, if at all, through the work in special methods and courses in practice teaching. The tendency in the practice teaching courses is to give much information about methods and devices, and but relatively little practice in using them intelligently.

Since the ability to teach efficiently is, in the last analysis, the

measure of the value of the teacher, the present teacher training courses are inadequate, in that they give insufficient time to training in the technique of teaching, and are content to turn out teachers who teach by formal methods instead of adapting their teaching to the characteristics of the group and the particular character of the lesson to be taught. It would seem, then, that from the standpoint of equipping agricultural teachers properly to teach in high schools, the present teacher training course is inefficient in that it does not follow good vocational education practice by training the prospective teacher to meet the actual specifications of the job for which he is being prepared.

The preceding discussion is based upon the typical situation in teacher training work. It would not be fair, however, not to point out that in many institutions there are teacher trainers who realize the need for radical modifications of the teacher training course. A number of experiments are now being conducted which give promise of improvement along the lines suggested in this discussion. The chief difficulty in securing improvement lies in two matters: (1) The inertia of the college machine, and the existence in most faculties of a number of ultra-conservative and reactionary people, and (2) the inherent difficulty in the plan which makes it almost impossible to secure a segregated group of prospective teachers.

The first difficulty will be gradually removed. The second, being inherent in Plan A, does not seem to be solvable as long as that plan is retained for teacher training.

The foregoing discussion was confined entirely to the efficiency of teacher training courses for the purpose of preparing instructors to teach in high schools. Of course, it is fully recognized that agricultural education, like all other forms of vocational education, in order to be socially and economically efficient must deal with more than the relative small group of those who attend the high school and elect to study agriculture. It must deal with the adult farmer and it must deal with the boy on the farm, the

apprentice farmer who has dropped out of the regular high school. As this fact is becoming recognized some progress is being made in developing part time, evening, dull season, and other typical lines of trade extension work, or apprenticeship training in the agricultural field. The teacher training institutions have made almost no attempt to train prospective teachers to deal with this situation. For a very considerable portion of the work which he is expected to be able to do, and will be more and more expected to do, the teacher of agriculture secures no special training in teacher training courses. This, of course, leaves him to secure all of this part of his training by "pick-up methods" after graduation, and means, of course, that the teacher training course, as now conducted, fails very definitely to equip its graduates with the ability to deal with what is rapidly becoming the most important phase of agricultural education.

The social function of agricultural education—Agricultural education is one form of vocational education. As such, its function is to serve society as an efficiency device for promoting desirable social ends. In this case, these desirable social ends are: the promotion of the more efficient production of agricultural wealth; and, as a result thereof, the improvement of economic and social conditions among those engaged in agricultural pursuits. Its value in terms of these social ends is determined by its efficiency and by the degree to which it is able to reach all groups needing service. This, in turn, depends on the preparation and employment of competent teachers and on the establishment of an organization that reaches all groups.

When we look squarely at the social function of this form of vocational education, we must gauge the value of present devices for training teachers solely by the degree to which it is probable that they will provide as teachers those who can most efficiently serve in this field. To the degree to which the present schemes sets up a presumption, or evidence, of doing this, they are socially efficient. To the degree to which they do not do this, they are socially inefficient.

In the light of the foregoing statements, with which we trust the reader will agree, let us examine the present methods of training agricultural teachers.

Up to the present time, agricultural education, as already stated, has been organized, on the whole, to meet only the needs of boys of high school age. It is true, that some attempts have recently been made to develop part time classes for older farm boys, and some work has been done with groups of adult farmers. These are comparatively recent developments, however, and have not, to any extent, affected the average teacher training practice. The training at present is practically confined to preparing teachers for conducting agricultural courses in high schools with adolescent groups. If the teacher of agriculture is to serve the real needs of his community, he must work with adults as well as with youth and not only under the working conditions of the high school, but under widely different conditions. The training plan is therefore inefficient in that it aims to provide only for one, and that one a relatively less important, set of working conditions.

The field of agriculture is so wide that no complete and final standard courses of instruction can be set up. The teacher is expected to be able to establish efficient instructional courses to meet all sorts of group needs according to the situation in the local community where he teaches. This calls for the ability to deal with all sorts of problems in curriculum making. On this count, the present training courses are weak in bringing the prospective teacher up to a level of doing ability. Teachers are "turned out," knowing that the problem exists, but not trained to deal with it.

The teacher of agriculture, like any other teacher, must have an actual working command of teaching technique. This means the ability to select methods and other teaching devices that are most efficient for any given teaching unit. This means a command of the art, as distinguished from the theory, of teaching. On this count, also, the present methods are weak, in that the

"basic courses" are too general, and the special methods courses are, as generally taught, conducted on an informational basis. In at least many cases, the tendency of these special methods courses is to give a formula rather than the ability to make a formula meet a given teaching situation. In all fairness, it should be pointed out that a number of more progressive teacher training institutions have recognized this situation. In them, steps are being taken to deal with it, especially along lines of improved practice teaching that includes doing objectives.

So long as agricultural education aims only at dealing with youth, it can make but little progress as a social agent. This has been found to be true in other fields of vocational education, and is equally true here. The large field of service lies in the group of adult employed workers. Teachers, who can successfully work with this group, must be recognized by the group as occupationally competent. The present training scheme, confining itself as it does to candidates for the bachelor's degree, offers little promise of turning out teachers who, while they may be equipped to teach youth in high schools, can command the vocational respect of adult farmers. Until some way is found whereby, through some adaptation of Plan C, successful farmers can be trained to serve as teachers of adult farmers, the present scheme is socially less efficient than it should be. Several institutions have realized the truth of the foregoing and are now making efforts to deal with the situation. At least one institution has recently succeeded in making contact with successful farmers who are hired to teach group courses for adults. This institution has arranged to give these prospective teachers an intensive teacher training course according to Plan C, and has had some success with the venture. The above discussion should not be interpreted as in any way failing to recognize that much good work has been done in secondary agricultural education. Rather should it be taken as a statement that training in secondary agriculture for boys and men, and girls and women, for that matter, will never meet the

social need until it deals with the adult as earnestly as it does with the youth.

The things that have been accomplished by some of the graduates of present training courses are not to be ignored. Some of the clean cut, enthusiastic young men going into teaching from the land grant colleges have accomplished wonders. One cannot help wondering, however, how much better they might have done, and how much difficulty they might have avoided, and how much more service they might have been to the cause, had their training been so organized as to equip them better for the work they have to do.

THE TRAINING OF HOME ECONOMICS TEACHERS

The present provision for training teachers of home economics, or home making, is essentially similar to that already described for the training of agricultural teachers. The almost exclusive use of Plan A; the four year course leading to the bachelor's degree; the relative emphasis on informational technical content, basic sciences and teaching technique; all these things are as characteristic of teacher training in this field as in that just discussed. Hence that discussion need not be repeated here. It is equally true that more attention has been centered on girls of high school age than on the adult woman, though this is true to a less extent than in agriculture. Adequate occupational experience is assumed to be secured by confining teacher training to "house daughters" who are supposed to have been trained by Mother in the practice of the household arts. In practice, however, this provision has not amounted to much, since any girl who has ever had any home at all, can meet this requirement.

The net result, for good or evil, has been to exclude, as a teacher, the woman who has actually conducted a home, unless she happens to be a college graduate; and to put the teaching of at least the high school group into the hands of young women

fresh from the college course. Consequently, we have the spectacle of young women, who, in many cases, have never had the actual responsibility of managing a home, teaching others how to meet this responsibility, or teaching others how to cook or sew when their own experience may have been confined to college courses, supplemented by little ventures in "social cooking." This is not always the case, of course, because some of these teachers have come from homes where they were well trained, but this also is by no means always true. Vocational competence is certainly not insured by any basic methods of selection for the teacher training group. If the theory of the need for adequate participating experience holds here, it would seem that the results in terms of the social objectives of home making training might be considerably less than society has a right to expect.

The answer to this criticism seems to be based on the following thesis: The home of the past was inefficient, and the home of the present, or what is left of it, is equally inefficient, but chiefly on the technical and management side. "Mother" of twenty years ago may have known how to cook and make clothing, but she did not know the science of calories, or how to budget her income, or how to take care of her children in a scientific manner.

The child death rate in those days was appalling. Furthermore, modern conditions of living have accentuated the need for the more scientific handling of resources, of time and of energy. The woman of today does not need so much to be taught how to do as to be taught intelligently to decide what to do. In all this field of technical knowledge, institutions of learning have run far in advance of the practice of the home. Hence, under these conditions, the young woman, fresh from the latest training, is best equipped to teach it to others. This is the argument. How far it is valid the reader must determine for himself, by drawing on his own observations and experiences.

In general the same questions as to efficiency and the same suggestions made for agricultural teacher training apply to the

training of teachers of home making. Therefore, they are not repeated here. Certain differences in the situation should, however, be brought to the reader's attention.

As already mentioned, home making training has paid more attention to the needs of the adult home maker than has agriculture up to the present time. A considerable proportion of this training is now given in evening "trade extension" classes.¹ In many states a serious attempt has been made to secure for these classes women having a large amount of successful home making experience. In many cases, the teacher of home making in the day school must also teach such classes. The failure of the typical teacher training course to provide special training for this particular form of teaching becomes more accentuated here than in the case of agriculture, since the home making is now engaged to some extent with adults while agriculture is still largely beginning to be concerned with the necessity of serving them. Moreover, up to the present time but little attempt has been made to provide special training courses for such competent women as have been utilized for extension classes.

On the whole, therefore, present programs for the training of home making teachers offer but little, if any, more promise of social efficiency than do the programs for agriculture. The training is in the hands of the colleges and reflects the traditional attitude of such institutions. The segregated group is, as usual, under Plan A, conspicuous by its absence, and the occupational equipment as well as the professional equipment of the graduates is of doubtful adequacy. Change must also come about against the inertia and conservatism of faculties. In spite of the recognition of the real need, by many workers in this field, and the attempts that have been made, and are being made, to improve the situation, home making training seems, as long as present conditions exist, likely to fall far short of the maximum of the invaluable social service that it was expected to render to the American home.

¹ See report, Federal Board for Vocational Education for 1923-24.

THE TRAINING OF TRADE AND INDUSTRIAL TEACHERS

When we come to consider the training of trade and industrial teachers we find a situation somewhat different from that described under home economics and agriculture. For reasons that need not be discussed here, there has from the beginning been a closer cooperation between industry and industrial education than between the corresponding groups in the other fields. This could not fail to have its effect on industrial education and, in turn, affect teacher training programs, both as to content and objectives. Since much industrial education is given outside of publicly controlled schools, in fact, in no school at all, but by the journeyman or the foreman in the occupation itself, the problem of teacher training has also had to be considered as of wider scope than that of training teachers just for service in schools and only under school conditions.

In view of these facts, one would naturally expect to find the situation in teacher training for industrial education somewhat different from that of the other fields, and this is the case. In thirty states, teacher training is given in non-residential courses, essentially on some form of Plan C. In sixteen states, both Plan A and Plan C are in operation. In only one state is Plan A alone relied upon for securing trade and industrial teachers, and in this case the curriculum is distinctly different from those commonly conducted under that plan.

From the standpoint of the suggestions and criticisms made in this chapter, the situation in trade and industrial teacher training is therefore better than in the other fields. It is better to the degree that better arrangements have been provided for securing occupationally competent persons and for making the training accessible, and to the degree that at least the chance has been afforded to prevent collegiate traditions and machinery from interfering with efficient work.

Characteristics of trade and industrial teacher training—Trade and industrial teacher training as it has developed has concerned itself with four major problems as follows:

1. The training of teachers for pre-employment schools.
2. The training of teachers for trade extension work.
3. The training of teachers as industrial or plant instructors.
4. Teacher training for foremen.

The discussion will therefore be taken up under these four heads.

The training of day school teachers—Here we find both Plan A and Plan C in use. Where Plan A is used, with the exception of the one state already mentioned, the questions raised and the criticisms made will apply as well here as in other fields, and so are not repeated. Our chief interest is with the forms taken by Plan C for this special line of teacher training.

In general, Plan C has been organized in two ways: According to the first, the training is given by an itinerant teacher trainer attached either to the training institution or to the state office. Groups are formed in different localities, and the teacher trainer goes either from group to group or deals with different groups in series.

According to the second form of organization, local teacher trainers are developed in "strategic" localities, and these local trainers handle the group under the general supervision of the teacher trainer.

The situation in trade and industrial education is different from that in agriculture and home economics in that industrial training tends to be located chiefly in relatively large population centers. This is much less true in the other fields. This means that it is much easier in many cases to bring together groups of teachable size at certain points where a "local market" exists for the teachers after they have been trained. As a rule, day school teachers also teach evening classes so that the program should include training for both sets of working conditions. In such cases

the training is for both day and evening teachers simultaneously. Both plans are in use and both, when well handled, give efficient results.

The evening school teacher—The only way to train vocational instructors for evening schools is to reach them in the communities where they reside and teach. They are usually selected from the workmen of the locality who are occupationally competent, most of them usually having had some successful experience as foremen. Usually also, they must be trained for teaching through evening classes. Already having "C", they must be given the "T" and "I" necessary to make them effective teachers of the occupational content, of which they are already master. Such teachers may be trained either in a pre-employment class before becoming instructors or on a professional improvement basis after they start to teach. The best results are secured where both services are rendered. In any case, however, the courses must be short and very direct, dealing almost entirely with the technique of teaching, including all such matters, for example, as how to arrange a class, how to keep records, how to ask questions, how to test students, how to demonstrate and illustrate, how to analyze and get trade content, how to arrange this content in a progressive teaching order, and how to prepare and use lesson sheets.

Such courses, given for as short a period as ten or fifteen hours, have proved very effective for this special group of teachers in this phase of the work. No distinction has been made between the content as given to men and that given to women, and mixed groups have frequently been organized.

The isolated teacher—While the concentration of industrial education in large centers makes possible, as pointed out above, the formation of teacher training groups, there exists also the case of the isolated teacher. This is more common with trade extension courses than with day schools. Wherever this case occurs, it presents one of the most difficult teacher training problems.

It has been attacked in two ways, but sufficient experience has not been secured with either, to warrant any definite statement as to their efficiency as a general proposition.

The first way has been through itinerant teacher training, where the teacher trainer goes from one locality to another, spending a day or so with each teacher, in helping him with his difficulties. This is, of course, largely unorganized training. In at least one state, success has been reported in the use of a specially worked out correspondence course.

Training foremen as instructors—Practically every foreman has instructing responsibilities. He discharges these responsibilities under conditions entirely different from those which prevail in the school or in the evening class. Most of his instruction work is unorganized. This form of instructor training is sufficiently important to warrant notice here. Its purpose is through special training courses, to give foremen the minimum of the essential elements of professional training which they can use to advantage under the working conditions. These elements are generally recognized as including: an understanding of the distinction between the teaching operation and telling or showing; an understanding of the state of mind of a learner as compared with that of a competent worker; an understanding of the steps in the formal lesson and their function; and some command of the methods suitable to shop instruction which go with these steps. Courses of from ten to twenty hours have been found quite sufficient to give as much equipment as the average foreman can profitably use under the conditions under which he has to teach.

Training plant instructors—Under a type of organization adopted by some industrial plants, certain expert workers are employed as instructors, either on full time, or at such times as their services are required. This is perhaps particularly true where apprenticeship schemes are in operation. A few training courses for such plant instructors have been successfully developed. Evidently the course would be somewhat more exten-

sive than that found adequate for foremen, but would be considerably less extensive than that required for the training of day school teachers. Such courses have commonly included, in addition to what is given to the foreman, some training in the principles of effective progression in learning, since these instructors often have to teach a progressively arranged course, or have to construct one for themselves.

Discussion—From the foregoing brief discussion, it will be evident that teacher training in the trade and industrial field has accepted and utilized Plan C to a considerable extent; that it has not in general resorted to standardized programs; and that it has paid more attention to the desirability of training the segregated group. In short, the proposition as a whole is less subject to the criticism and suggestions made with regard to teacher training for agriculture and home economics.

So far as teacher training as conducted in institutions of college grade is concerned, there is little to choose between the situation in trade and industrial teacher training and in teacher training for other fields. What has been said with regard to the effects of tradition, rigidity of administration, informational instead of functioning content, range, balance, emphasis, and the like would apply here as much as it would in the other vocational fields. It will be recalled that the sample course used in discussing Plan A was a trade and industrial teacher training course. When we get outside of the residential collegiate teacher training course (Plan A), we find all sorts of situations in the courses conducted by the colleges. In many cases, the extension teacher training courses deal with practically the same content as the residential training courses. In many cases they are equally hampered by collegiate restrictions. In one State, for example, under the restrictions of the State University, no class can be formed for less than fifteen students. Enforcement of this regulation has practically paralyzed the extension teacher training work in the State, since in many cases it is not possible to secure a group of fifteen

prospective teachers who are qualified. In any event, such a group would represent the training of many more teachers than the local community could absorb.

The simple converting of a professor of education or of psychology from a resident member of the faculty to an itinerant member of the faculty does not necessarily improve the situation in terms of efficient service. On the other hand, it would be only fair to point out that, in a number of cases, the teacher trainers attached to State institutions have conducted very successful and efficient teacher training courses on the Plan C basis, but only where the university was sufficiently enlightened to give them a free hand to work in accord with the demands of the job and the given conditions.

Where Plan C is conducted directly out of the State office, whatever difficulties may come out of collegiate control are theoretically avoided. The teacher trainer is the agent of the State board for vocational education; is responsible only for the turning out of efficient teachers; and has a perfectly free hand to develop his content and his organization in the most efficient way. As these facts have become obvious, the tendency has been for the State board for vocational education directly to take over the teacher training function so far as industrial teacher training is concerned. There is reason also to believe that the drift is in that direction, although in many cases the State institution is so strong, politically and otherwise, that a change of this character is not likely to come about in the immediate future.

In one phase of teacher training in trade and industry, there has been a very sharp split between two groups. A number of State boards of vocational education have held that all Federal and State funds appropriated for that purpose should be expended in training teachers to teach only in the State and Federally aided trade and industrial schools. In other cases, State boards have held that good teaching, wherever conducted, improves the efficiency of vocational education. They, therefore, approve of

teacher training for individuals such as foremen and plant instructors, who would not enter the public school service. In our opinion the second point of view is that which makes for the greater social value of trade and industrial education.

Training of conference leaders—The importance of including in the program of industrial education the training of minor executives has only recently come to be generally realized. As a result there have been developed various courses, or devices, both for training prospective foremen and for assisting foremen already employed as such to discharge their responsibilities more efficiently. Among these devices for improving foremanship has come a development of what is known as the "conference method." This consists, essentially, in assisting a group of foremen to pool and to organize their experiences under directive leadership. This method is not instructional in its character in the sense that there is any use made of the formal lesson or that the conference leader is assumed to be an instructor.

Considerable work of this kind has been successfully carried on in a number of the States: in some cases, by teacher trainers connected with State institutions; and in other cases, by supervisors of trade and industrial education attached to State offices. The Federal Board for Vocational Education has shown great interest in the development of this work, and has contributed research and service in the development of training programs for conference leaders.

Evidently the specifications of the job of a conference leader are entirely different from those of teacher. This means a correspondingly different training course. Such a training course has been developed through cooperative work between the Federal Board and a number of State supervisors and teacher trainers. Up to the present time, however, it has only been used in connection with conferences held under the auspices of the Federal Board, which have been attended by representatives of industry and of State boards for vocational education.

The training of teacher trainers—As experience in teacher training has developed, there has been accumulated considerable knowledge based on experience and sound thinking, about successful technique and about the most efficient working conditions for teaching and learning. This gives us for use a special body of technical information pertaining to teacher training work, just as in the case of conference work. The Federal Board has conducted researches and has, in cooperation with State representatives, organized these experiences into tentative courses for the training of teacher trainers.

This course has not, up to the present time, been used sufficiently to enable any statement to be made, nor is it yet in print. Experience with it in a number of Federal Board conferences has indicated, however, that it is organized along right lines and has already been of considerable value to those teacher trainers who assisted in its development.

Related subject matter—Ever since the program of vocational education started there has been a more or less definite recognition of the fact that any competent worker has two kinds of assets: manipulative and non-manipulative job assets. The former is commonly called skill. The latter covers all other equipment of the worker for his job, and consists both of information and the ability to use that information. In the complete Richard's formula ($E = M + T + I + GV$), "GV" means general vocational information as contrasted with applied technical knowledge "T" and the ability to apply knowledge intelligently to problems and situations in the occupation (I). "T", "I" and "GV" together represent this non-manipulative asset.¹

In the early days of the development of vocational programs, the preceding facts were expressed by talking about shop or job training and related subject matter. Nobody knew exactly what

¹See also, however, footnote on page 42, where this Richard's formula is stated in terms of Federal Board use as $E = M + T + I + J$. In the Federal Board formula T, I and J together represent the non-manipulative assets of the worker.

this related subject matter should be except, in a general way, that it was the part of the asset of the competent worker, which was non-manipulative in character. As would be naturally expected, a great deal of content of a non-functioning character was taught as related subject matter. As vocational educators have gained in experience and knowledge of their problem, the term "related subject matter" has been less used and the terms "technical content" and "general vocational content" have been substituted therefor. In practice, most of what has been taught as related subject matter has been more or less, frequently less, functioning general vocational content rather than specific occupational technical content.

These facts would not be of importance in teacher training had they not led to certain classification of teachers which have, in turn, affected the work of teacher training agencies. This classification has divided vocational teachers into two groups. Teachers of M values, that is, shop or practical teachers, and teachers of related subject matter, or technical teachers.

The technical teacher—Under the classification just described, it was roughly assumed that the practical or shop instructor taught the "what," and the technical instructor taught the "why." In explaining the difference in functions, the statement was once made that it was the business of the technical teacher to teach that part of the occupational content which the school authorities did not believe a competent occupationally trained teacher was sufficiently educated to teach. However that may be, the organization of the faculty of the vocational school into one group of technical teachers and another group of practical or shop teachers has not only persisted, but is still recognized under the plan of approval of teachers adopted by many states.

In general, where a very complete occupational experience is theoretically required of the practical or shop instructor, a considerable amount of additional technical or engineering training has been required of the technical teacher. This, of course, does

not affect the general program for teacher training, as to its efficiency, or lack of efficiency. It merely affects the character of the occupational content taught under Plan A, or the occupational content required under Plan C. The important question here is to what degree this double organization is necessary, and to what extent teacher training organizations should continue to accept it without protest.

Technical vs. shop instruction—As already stated, the shop instructor is theoretically supposed to teach the “how,” and the technical teacher the “why.” What has really happened, however, is that the shop instructor has taught both the “how” and the “why.” The technical teacher has taught content which was either a general or more abstract phase of the occupational “why,” or has taught certain subjects intended, at least, to be generally vocational in their character. In short, what the technical teacher is supposed to teach has actually been taught on the job by the shop instructor, and what the technical teacher has actually taught has usually been some rather poorly functioning general vocational content, and some general drawing, science and mathematics, which in many cases functioned scarcely at all in occupational equipment.

The more recent tendency in the best vocational schools has been to do away with the technical teacher, for these reasons: It has been found that a thoroughly trained, occupationally competent teacher possesses the technical knowledge in the form in which it is actually applied, and in which he is best able to teach it in connection with his training of the student in processes and skills. Experience has also shown that the two groups of instructors do not work together cooperatively. There is every evidence that the most efficient teacher training device will be that which gives to occupationally competent individuals the capacity to teach not only the specific jobs and immediately related technical content, but also to teach the general vocational content. This will, unquestionably, make it necessary to give, or, rather,

to include in teacher training courses specific training in the analysis and organization of such general vocational content, and probably, in addition, to give as much of this content as the expert worker is found not to possess.

In view of the trend of the experiences up to date, it would seem to be highly desirable that teacher training agencies should be giving serious consideration to the extension of their training courses to cover these new objectives.

Development of teacher training—The training of teachers of vocational education of less than college grade really dates from the passage of the National Vocational Education Act 1917. The passage of this act, and of the State acts complementary thereto, provided funds for the specific purpose of training teachers for trade and industrial, agricultural, and home economics vocational education. From the preceding discussions and statements, it must be evident that lying in the background and affecting the development of teacher training programs has been a struggle between two groups holding different theories and having different interests.

The first group has consisted of those State authorities, those students of vocational education, and those representatives of teacher training who have looked at the problem solely as one of securing efficient vocational education by providing thoroughly competent teachers. The second group consisting largely of colleges and other institutions of that general type, who have seen in the development of a new field of education an opportunity to secure more business and an extension of the market for the employment of more graduates. The first group have been interested only in getting as good teacher training as possible, since they feel, and in many cases they are, responsible for the quality of vocational education. Therefore they are not concerned with the agency by which teacher training is given, or with its traditions or customs. They hold that the only efficient vocational teacher is an individual who possesses the intrinsic qualifications

of a good teacher; who is a master of the occupation which he is to teach, and who has a thorough command of the teaching technique. They have no personal "axe to grind" in the matter, but they know, usually by practical experience either in vocational teaching or in supervising vocational education, what are the actual demands which the vocational teacher must meet, and are simply concerned with his being equipped to meet these demands successfully.

The second group, while well-intentioned, cannot avoid being affected by the traditions, the objectives, and the detached point of view of the institution of higher learning. This appears in the attempt to utilize the traditional four year course; in the emphasis laid upon the possession of the bachelor's degree; in the natural desire to carry on teacher training work with members of the regular student body. Evidences of this detached point of view appear in the degree to which their training courses, as already pointed out, are narrow in their scope in terms of the job to be done by the teacher subsequent to training; in the degree to which the objectives set up do not square with the demands of the teaching job; in the use of traditional academic methods of presentation, and in the balance which it is insisted must be maintained between the four groups of objectives (humanistic, scientific, technical and professional).

We have, therefore, on the one hand the institution of higher learning, or normal school, as the case may be, with its point of view, its traditional methods, its standard organization, and its power in the educational world over against the group of those who are primarily concerned only with securing thoroughly equipped teachers in order that vocational education may best serve its sociological and economic function in our democracy.

The situation at any given time has represented a balance between these two opposing groups in a sort of a tug of war. The previous discussion will indicate that at the present time the collegiate group are distinctly in the more advantageous position;

markedly so in agricultural and home economics teacher training, and for reasons already given considerably less so, in trade and industrial teacher training.

The fundamental question which has lain in the background during all this trouble has been whether Federal funds and State funds should be used for the purpose of promoting the interest of collegiate institutions with teacher training as a by-product; or whether these funds should be used primarily to train teachers as efficiently as possible with no incidental benefit to any agency as a by-product. This is a very plain statement, but it summarizes the situation.

It must be evident, from what has gone before, that it is extremely doubtful if thoroughly efficient teachers can be secured through the teacher training courses now being conducted by collegiate institutions. Until these institutions are prepared to modify very seriously their organization; until they are able and willing to set up the objectives of their training courses in terms of actual demands made upon the teacher of vocational education; until they can find some way so to modify their organization that occupationally competent individuals, intrinsically qualified for teaching and desirous of becoming teachers, can be admitted; and until they can so modify their content and methods as to enable their objectives to be put over on a "doing" rather than an "appreciation level," it does not look as if they could efficiently give to the public an adequate return for the public funds expended.

Such experience as has been secured up to the present time would seem to indicate that much more hope lies in the development of Plan C than in Plan A. It is to be hoped that the time will come when collegiate institutions to whom has been delegated the responsibility of training efficient teachers, and to whom have been entrusted public funds for that purpose, will find some way of developing teacher training work along the general lines of Plan C. Until this situation comes about, vocational education

will continue to be taught largely by teachers who are only partially equipped to meet the demands of their employment.

Admittedly, no teacher training program on a pre-employment basis can turn out a completely equipped teacher any more than any other vocational program on a pre-employment basis can turn out a thoroughly occupationally competent worker. Some students of vocational education hold that pre-employment training for teachers is not the most efficient device. They claim that given a thoroughly occupationally competent individual, teacher training can best be conducted through professional improvement work. A recent consensus of opinion among a group of State officers was that a very brief period of preliminary training of not over twenty or thirty hours, followed by a well organized scheme of professional training paralleling the actual participating experience of the teacher after he begins to teach, is a more efficient device than any longer pre-employment scheme. There is much in the experience obtained to date which indicates that there may be much truth in this point of view. Should it be shown to be correct, evidently, Plan A, with a long residential pre-employment course, will be ultimately abandoned. We will then see segregated groups taken into the college without regard to their academic attainments and given brief pre-employment training courses, followed by extension work of a professional improvement character. Otherwise, the entire teacher training program will ultimately pass out of the hands of collegiate institutions to be conducted by State departments of vocational education and other agencies on a non-collegiate basis.

QUESTIONS AND POINTS FOR DISCUSSION

1. If you had to form a selected group for teacher training under Plan C, what would you set up as entrance requirements? Give reasons in full.
2. Working under Plan C, what would be the relative advantages and disadvantages of:
 - a. A pre-employment course of ten evening meetings followed by meetings once a month on a professional improvement basis.

- b. A pre-employment course of thirty, two-hour meetings with no professional improvement work of an organized character, but casual assistance by the teacher trainer as the need arose.
 - c. A pre-employment course of twenty evening meetings of two hours each continued for two years, the first year previous to employment, the second parallel to employment as teachers.
3. Make a table of two columns showing the assets and liabilities of: (a) a man who has had several years' experience in the practice of a skilled trade subsequent to apprenticeship; and (b) a man who was taught his trade in a school where for four years he attended as a resident student, a Plan A course.
4. Suggest a plan of organization whereby a college could secure and train teachers who were occupationally competent under Plan C.
5. Are the difficulties in securing thoroughly competent teachers under Plan A fundamental to the plan, or could this plan be made efficient? If so, how?
6. Make as complete an inventory as you can of the demand of the job of a teacher in a full time day trade school. Would it make any difference if the school were for boys or for girls? If so, how?
7. Point out in detail why a trade extension teacher does not need as much teacher training as a prospective teacher in a full time day school.
8. Which is more important, to secure a teacher who knows his trade or a teacher who can teach his trade to others? Why?
9. Which is more important, to have a teacher who knows his trade and can teach it, but who is weak in social manners and customs or the reverse condition? Give reasons for your position on this question.
10. If you had charge of the organization of a trade school for boys, would you employ technical teachers and shop teachers or all shop teachers? Why?
11. Make a complete analysis of the weak points of Plan A and Plan C, using a list of efficiency factors which you think apply.
12. What is the difference in the assets for teaching of:
 - a. An individual who possesses all necessary skill and technical knowledge acquired in the course of an institutional training and
 - b. An individual who has acquired that same knowledge and skill by learning the trade through apprenticeship and journeyman-ship? Discuss.
13. What is the value of an informational command of general descriptive chemistry and physics for a teacher of agriculture? Of carpentry? Of home making?

14. Make an analysis of the cost items in Plans A, B and C.
15. Make a list of the additional assets for a teacher of a trade that would come out of the fact that he had completed a high school course of the usual type.
16. Secure a copy of the admission requirements for an A and M college. To what degree would the enforcement of these requirements tend to prevent the admission of people who are qualified as to occupational mastery to become teachers?
17. Secure a copy of a teacher training course under Plan A. Make a complete analysis of the apparent objectives of the different courses and compare these objectives with a similar analysis of the demands made upon a teacher of vocational education.

BIBLIOGRAPHY

The Selection and Training of Teachers for State Aided Industrial Schools, N. S., Bulletin No. 19, 1917.

This bulletin deals with the selection and training of teachers as the situation existed at the date of the publication. It indicates clearly the conception at that time of such things as qualification of industrial school teachers; the objections to prevailing methods of State certification; sources of industrial teachers; proposed schemes and a summary of conclusions and recommendations.

This bulletin was developed in cooperation with a special committee. This committee was assisted by the National Society and a conference of State executives; hence it represents very clearly the views of those who were engaged in vocational education at that time as to the question of securing adequately equipped teachers in trade and industrial schools.

Publications of the Federal Board for Vocational Education.

Agricultural Teacher Training. Bulletin No. 90. Dr. Theodore H. Eaton.

This bulletin, issued in 1923, gives the consensus of opinion of a representative group of men engaged in teacher training for agriculture. Covers the selection of groups, the recruiting and preparation of novice teachers and the principles on which a teacher training program for agricultural teachers should be developed. It also gives suggestive courses and what is considered as functioning content. The

type plan is an A type. Valuable as source material for the reader who wishes to secure further information as to statements made in the text and who wishes to secure a further knowledge of the characteristics of Plan A and the point of view of those conducting such a plan.

The Training of Teachers of Vocational Agriculture. Bulletin No. 27. W. G. Hummell. Published in 1919. The bulletin of which No. 90 is an extension.

Teacher Training in Agriculture. Bulletin No. 94. H. M. Skidmore.

Published in 1924. This bulletin is a study of the present situation in agricultural teacher training with some suggestions as to weaknesses and possibilities of improvement. Of interest in this connection on account of its bearing on certain statements and criticisms made in the text.

Home Economics Education. Organization and Administration. Bulletin No. 28. Revised edition.

Published in 1924. The section on teacher training contains considerable information as to the status of teacher training in this field and hence has considerable bearing on the text.

A Study of Home Economics Education in Teacher Training Institutions for Negroes. Carrie A. Lyford. Bulletin No. 79. Describes the situation in teacher training institutions at the time of publication.

Trade and Industrial Education. Organization and Administration. Bulletin No. 17, revised edition. The Staff of the Trade and Industrial Education Service.

Contains a section on teacher training which, to some extent, indicates the situation in the trade and industrial field as to use of the different plans discussed in the text.

This bulletin also contains the text of the National Vocational Act. Section 12 covers the requirement for occupational experience referred to in discussion in a number of places in this chapter.

Foremanship Course vs. Instructor Training Courses. Allen. Bulletin No. 60.

A discussion of some of the problems in training foremen as instructors. An extension of the text on that subject.

Improving Foremanship. Allen. Bulletin No. 61.

This bulletin is an extension of a number of discussions in the text. It includes a consideration of the different types of courses, advantages and disadvantages, and discusses the efficiency of different typical courses in preparing teachers of trade and industrial education.

Agricultural Education. Hawkins, Works, Stimpson. Bulletin No. 26.

Parts II and III discuss teacher training. Part III deals with professional improvement. Published in 1918. Largely now of interest as indicating the stage of the thinking on those subjects at the time of publication.

Year Book. 1923.

In the sections devoted to the different fields of vocational education, there are statements and discussions as to such matters as the qualifications of teachers, the present stage of development of training programs and other matter extremely pertinent to this chapter.

Report of the Commission on National Aid to Vocational Education. 63 Congress, Second Session. H.R. No. 1004.

This report contains the arguments for Federal Aid for teacher training and suggests some of the conditions that should be met if such training is to serve its intended purpose.

The Foreman and His Job. Charles R. Allen. J. B. Lippincott Company, Philadelphia.

A section of this book deals with the special instructing functions of foremen and suggests the content of a teacher training course for this special purpose.

APPENDIX

- I. ILLUSTRATIVE CONFERENCE (THE TIME CLOCK)
- II. ILLUSTRATIVE FORMS AND BLANKS FOR THE GENERAL PART
TIME SCHOOL

I

ILLUSTRATIVE CONFERENCE (ON THE TIME CLOCK)

In the chapter on the Continuation School, considerable attention is paid to the conference as a teaching device. To illustrate its aims, topics and procedures, reference was frequently made to an exposition of the methods of the conference in an article on "Job Morale" by R. W. Kent, published in the May issue of the Vocational Magazine for 1924, in which the shop or office time clock was used as the situation or problem for discussion. Because of the pertinency of the entire article, it is reprinted here in full.

JOB MORALE

R. W. KENT

We have in the vocational education field been representing the equipment necessary for efficient service in an occupation by the formula:

$$E = M + T + I, \text{ where:}$$

E represents the equipment, skill and knowledge required for efficient service in the given occupation.

M represents the manipulative skill required either with tools or in the control of machines.

T represents knowledge of the technical content of the particular occupation in question.

I represents the job intelligence of the worker.¹

¹ See also page 42 where the Richard's formula is given as used in Federal Board publications. The formula given above would be $E = M + T + I + J$. In it, *I* would represent the job knowledge of the worker and *J* the job intelligence.

We have always realized that there is in reality another very vital factor necessary but we have so far failed to give it a very prominent place, as is shown by its omission from the above formula so commonly used. I refer to that thing which we sometimes call "job morale."

I mean by job morale those things not included in the formula quoted above, that contribute directly to producing more valuable workers. I mean honesty, reliability, enthusiasm, appreciation, etc., applied directly to the job. I do not mean honesty in the paying of grocery bills, reliability in family relations, enthusiasm about community affairs, etc. These latter are highly desirable things, but they probably do not affect job morale directly. They may affect it indirectly but we know very little about such things.

We have taken the general attitude that all such subjects as these do not belong to the vocational program but to the general education program. We have accordingly in our civics and English classes of our vocational schools preached a little about job morale along with general talks about honesty, reliability, etc. And we have used job situations to illustrate points in such general lessons. But we have seldom attempted to teach job morale as a specific thing without wandering off into a lot of general things about loyalty to country, love of your fellow-man, etc. We have assumed that these things of morale were general things that once acquired applied equally to all of life's situations, much as we assumed that memory was a general trait, and that drill in memorizing a Latin vocabulary would improve equally the ability to remember Latin words and telephone numbers. We have proved definitely that memory is not a general thing, and we have collected much data on just how much is carried over from training in memorizing one kind of material to memorizing different kinds of material. We do not have such exact information in regard to such things as those mentioned above under morale, but we do know that only too often people are honest in one situation and dishonest in another, loyal to their country and dis-

loyal to their employer, reliable on the job and very unreliable in their family relations.

It seems probable at least that these things that we have considered general traits are in reality a whole series of more specific traits built up as such and eventually, because of the wide range of experience in such fields, appearing to be general traits.

It also seems probable that even though the desire to be honest for example, were a general trait applicable in an equal degree to all life's activities, that it would fail to produce equal results because of the complex relations of our modern life and the inability of the individual to think his way with equal clearness through all these situations. It is not uncommon, for example, for men to be scrupulously honest in paying their debts and at the same time see no dishonesty in turning out a job not quite up to the specifications.

If, then, job morale is a specific thing and not simply the natural outgrowth of general traits, inherent or acquired, of honesty, loyalty, perseverance, etc., we need to consider the possibilities of teaching it as a specific thing instead of treating it in the general way we have been doing.

Industry is realizing more and more that one of the biggest causes of waste is poor job morale. It is trying all kinds of schemes to improve this vital element in its structure. Bonus schemes, profit-sharing, differential piece rates, gain sharing, shorter hours, better pay and personnel departments are being tried out everywhere. It is probably true that this problem must be solved mostly by changing conditions in industry, but this does not relieve the vocational school of its responsibility for giving whatever help it can, however small it may be.

It is the purpose of this article to discuss simply one phase of this problem of the vocational school: the possibility of contributing to job morale by classroom work. I believe that there are many other ways in which the vocational school can contribute and that some of these at least may be more effective than any

classroom work, but for the present I wish to confine my remarks to this one phase.

I think we can immediately discard the idea of preaching or lecturing by the instructor on this subject. We do not have absolute data in this field as we do in many educational fields, but there is quite general agreement amongst people who have been in positions to observe such things, that preaching or lecturing does not produce the desired results.

But we have found that, in certain cases at least, a properly-directed discussion of such things may produce some worthwhile results. It has been found, for example, that in foremen conferences a concrete discussion of specific phases of the foremen's work, if properly handled, creates a new understanding of, and interest in their jobs, and a noticeable improvement in attitude toward their jobs.

It is true that foremen are a selected group with more ability and training than the average, and therefore more apt to profit by any form of instruction. But it is also true that the level of job morale attempted and secured is higher than would be attempted in such discussions with pupils in a vocational school. I believe that if objectives are set consistent with the group, that results relatively as good may be secured with pupils in a vocational school, by this method, as is secured in foremen conferences.

Foremen conferences are built on the common background of the actual experience of its members. New ideas must be developed from this background in such a manner that the group feels that it has discovered them; it is fatal for the group to feel that the conference leader has presented these ideas ready made. The ultimate aim of such a conference is not to develop a series of facts, but to develop interest in, and the ability on the part of the members of the group, to think logically about the subject in hand.

The following is an illustration of how such a conference on

one of the points of job morale might be conducted with a group of boys or girls in a trade school. This is an illustration and not an example; that is, it shows the general trend of the discussion, but does not attempt to give all the details. Of course the pupils will not always answer as you want them to and many additional suggestive questions, or entirely different ones from those shown, may have to be used. It is neither possible nor desirable to give an example for the instructor to follow in detail in such a lesson, for such a lesson cannot be successful if turned out with jigs and fixtures. The instructor must be a master mechanic, with a definite plan of action to be sure, but ever ready and able to make the necessary special set-ups which are required to turn out the desired product from material of varying size, shape and texture.

CLASS DISCUSSION TO GET STUDENTS TO REALIZE THE
NECESSITY OF BEING PROMPT AND REGULAR
IN ATTENDANCE AT WORK

I. Can anyone tell me what a time clock is?

1st S. It is a clock that shows when you get to work.

2nd S. It punches the time you get to work on a card.

3rd S. You have to put the card in a slot and push down a lever.

4th S. The one I punched last summer had a big arm that you swung round to your number and then pushed in.

I. All right, but what do employers have time clocks for?

1st S. To find when you come late.

2nd S. To find out if you leave before quitting time.

3rd S. To find out when you are absent.

I. How does a time clock show when you are late or absent, or leave early?

1st S. When you are late or leave early it punches in red.

2nd S. When you are absent it leaves a blank space, because your card will not go down in the slot far enough to punch on the line for the day you were absent.

I. Do all companies have time clocks?

1st S. Yes.

2nd S. No, I worked last summer at a place where they had a time keeper.

I. What is a time keeper?

1st S. A time keepèr is a man who keeps a record of the time you come to work.

2nd S. Yes, and he keeps a record of exactly how many hours you work, and figures up your pay.

I. Do all companies have a time keeper or a time clock?

1st S. Yes.

2nd S. No they don't. I worked at a place last summer where there was no time keeper or time clock.

I. How did the boss know if you got to work on time or if you were there at all?

S. Oh, he knew all right; he was always there himself.

I. Would you call the boss his own time keeper in that case?

S. Yes, I think I would.

I. It seems to me then that there is always some kind of a time keeper in all business, and that the time keeper may be a clock, or the boss, or a man called a time keeper. Would you all agree with that?

[NOTE: Instructor asks several students and they all agree.]

I. Why do some firms use time clocks instead of time keepers?

[NOTE: Direct discussion to bring out that they are more convenient; save time and expense; keep a more accurate record; etc.]

I. Some workmen object to punching a time clock. How do you feel about it?

1st S. I think if you will trust people they will work better.

2nd S. I don't think so. I know some fellows where I worked last summer who were always trying to loaf.

3rd S. Well, I know that where I worked, the boss did not watch us very close and we all worked harder than if he had always been snooping around.

I. Then you can trust some people but can't trust all of them. Would you agree to that?

[NOTE: Instructor asks several in the class and they all agree, and he asks if anyone does not agree, and no one disagrees.]

I. How would an employer who hired a lot of men do then, have those whom he could not trust punch the clock and tell the others they need not do so?

1st S. Yes, I think that would be all right.

2nd S. No, that won't work because those who had to punch the clock would get good and sore.

[NOTE: Instructor secures agreement that it is not feasible for some to punch clock and others not, but one student is still not convinced and says: "Well, you can beat a time clock anyway."]

I. How is that?

1st S. You can have some one else punch for you.

2nd S. Yes, but won't you get caught sooner or later?

1st S. Yes, unless you are slick enough.

I. But don't slick people get caught finally?

3rd S. I know several fellows who were caught doing that.

I. What happened to them?

S. They got fired.

I. Why were they fired, because they had some one punch their card?

S. Because they cheated.

I. Is that the same as stealing?

1st S. No.

2nd S. Yes, it is.

1st S. Well, they didn't take anything.

I. Didn't they take some time?

1st S. Y-es.

3rd S. And they got paid for that time, so it is just the same as though they had stolen money.

I. Asks several other students what they think about it and they agree that the 3rd S. is right.

I. Now let us get back to the time clock again. What happens if you punch in late on the clock?

S. You get called down.

I. Why isn't it all right for you to come late?

S. Because you get paid for eight hours' work and when you come late you don't work as long as you are paid for.

I. Would it be all right if you were paid by the hour, or if you stayed overtime to make up for the time you were late?

[NOTE: Direct discussion to bring out such things as:—

1. The dependence of one worker on another, and how tardiness of one worker may interfere with or stop work of another worker.

2. Cost of idle machines.
3. Cost of idle space.
4. Employer cannot get work out as promised if he cannot depend on workers putting in full time every day, and he would lose customers, etc.]

Make a list of such things on the blackboard.

- I. Is it all right to stay away from work whenever you don't feel good?

1st S. Yes.

2nd S. No it isn't, because it is just being tardy only worse.

[NOTE: Direct discussion along same lines as indicated under tardiness, and add to the list on the board any new things brought out.]

- I. Some fellows think it does not make any difference if they are just a minute or two late. What do you think about it?

[NOTE: Direct discussion to bring out fact that if fellows one minute late are excused, then those two minutes late will say, "Well, I was only one minute later than that fellow," etc., until men would be dragging in at all hours.]

- I. What happens to fellows who are habitually late or who are frequently absent?

S. They get fired.

- I. Does it hurt your chances of getting another job to be fired for being late?

S. Yes.

- I. There are some fellows are there not, who never learn to be prompt and regular?

S. Yes. I know a fellow like that.

- I. What kind of a job does he have?

S. He doesn't have any very long. He just drifts around from place to place.

- I. Does he get good pay?

S. Sometimes, but not often.

- I. Does he lose much time, that is, is he out of a job much of the time?

S. Yes, about half the time.

- I. Even if he makes fair money when at work, are his earnings for the year large or small?

S. Pretty small; he just lives from hand to mouth.

[NOTE: Direct discussion to draw out kinds of jobs that such fellows generally get. Make a list of them on the blackboard. Some such list as follows can be drawn out: Odd

jobs of all kinds, such as cleaning up trash, common labor, etc.; roughest kind of labor; jobs that other fellows don't want and the employer has a hard time getting men to fill; temporary work; pick up a steady job by chance now and then but soon get fired.]

I. Does a good record on your time card help you get a better job?

S. Yes.

[NOTE: Be sure to uncover any disagreement to this in the class and direct the discussion to disprove it. *Do not* attempt or think you can win over those who disagree, by lecturing to them to show them where they are wrong.]

I. Some fellows have an idea that if they could get a job as a foreman or something of that kind, they would not have to be so careful about getting to work on time and not being absent. Do you think that is true?

[NOTE: Direct discussion to show that such jobs require even more promptness and regularity of attendance than ordinary jobs. Bring out facts such as: foreman responsible for keeping work moving to workers, and if he is not there some workers may not be kept busy; foreman supposed to give instruction as to how work is to be done and if he is not there work may be done wrong, etc.]

S. Well, our superintendent comes when he feels like it and leaves early in the afternoon.

[NOTE: Direct discussion to show that superintendent is paid for a different thing than an ordinary worker; he may have outside duties; he is paid for planning and probably does a lot of this at home at night; if he has an understanding with the boss (and he probably has) that he is to come and go as he thinks best, then he is, if he does his work, not cheating, etc.]

[NOTE: The terms first students (1st S.), second student (2nd S.), etc., are not used to designate specific people but simply to indicate that different students enter into the discussion. It is assumed that the instructor will see that all students are brought into the discussion and that questions are properly directed to secure the best interest and attention from the greatest possible number.]

There is for many instructors a temptation to moralize too much and this can be done by discussion as well as by lecture.

After the list of the kind of jobs held by people who are habitually late or irregular in attendance had been drawn out, the instructor might go further. He could point out definitely that everyone in the class should be very careful to correct any such bad habits he might have, or might proceed with the discussion so as to have the students say definitely that they would not want to work at such jobs as those listed. Again we have no definite measure of the benefit or the opposite, produced by such a procedure, because we have not yet devised definite measures for such things, but it is certainly an open question at least if such a procedure does not produce more harm than good. Our results from such moralizing have not been so successful but that we can afford to discard such methods long enough to give some other methods a fair trial.

I know that even some people who will agree that the method I have outlined is a good method will, however, contend that it cannot be used in vocational schools because it takes too much time to cover the ground with such a method. But the question is not how much ground can be covered, but what results can be obtained. It is undoubtedly true that much less ground can be covered by the method outlined than by the informational method, where the instructor lectures or assigns reading material and then asks a few questions to see if the student has memorized it. But I believe that if measured in terms of results in improved attitudes, habits, etc., that the discussion or conference method will show the greater returns. While I have no concrete figures to prove this statement, I believe that it is supported by the soundest principles of educational psychology.

Summary. We need then to expend our formula: $E = M + T + I$ to $E = M + T + I + JM$, where JM equals job morale. Conditions in industry are probably the greatest factor in determining job morale, but the vocational school has a responsibility in this field no matter how small its possible contribution may be. Classroom work in this field should be carried on by

the conference method.¹ The guiding principles in carrying on such a conference should be:

1. Building on the common background of actual experience of the members of the group.
2. Develop the desired points by directing the discussion of the group and not by presenting them to the group ready made.
3. A crude idea developed from the discussion of the group is better than a finished product made by the instructor.
4. Direct the discussion from behind the scenes; the group must feel that it has itself reached the conclusion.
5. It is fatal for the group to feel that the conference leader has presented the ideas ready made.
6. The aim of such a conference is not to develop a series of facts, *per se*—except incidentally—but to develop interest, understanding of conditions and ability to think logically about the subject in hand.
7. Do not moralize. Direct the discussion to a point where the group can easily see the moral, but don't try to push it down their throats.

¹ See also, however, footnote on page 42. In the Federal Board publications, this formula would be stated as follows: $E=M+T+I+J+JM$ in which J would mean job intelligence and JM job morale, I being job knowledge as contrasted with technical knowledge.

II

ILLUSTRATIVE FORMS AND BLANKS FOR THE GENERAL PART TIME SCHOOL

By special permission, Mr. J. T. Ryan, Supervisor of Industrial Education for Kentucky has authorized the use of some suggestive forms and blanks developed by him and used successfully in the compulsory continuation schools of his own and other states. These are taken from a paper bound publication copyrighted by him under the title, "Instructional Elements for an Ungraded Course in Adjustment to Life's Activities." This consists of an assembly or collection of blanks, accompanied by helpful suggestions to the teacher, which pupils use for recording facts and opinions regarding situations about which the group is thinking.

In the foreword, Mr. Ryan gives his conception of these blanks and their use as follows:

"The larger number of children leaving school at an early age to seek employment constitutes an important division of a community's population. School and city officials are now facing the problem of social adjustment of these young people.

"The purpose of a part time class is to fix definite objectives in the minds of working boys and girls, to equip them with a sounder basis of economic reasoning; to teach them the importance of values so their earnings may be invested to the enrichment of their community and themselves, and to create a more wholesome attitude toward community and State.

"Because of its content and arrangement, this text is ungraded and may be used successfully with groups whose ages and scholastic attainments are at considerable variance. It has been prepared not only for continuation and pre-employment classes but also as supplementary material for stimulating thought along

social and economic lines in the Junior High School or High School.

"It has been the author's intention to provide a means of securing a definite and concrete expression of the pupil's conception of daily life by guiding discussion through the use of forms. The forms may be developed on the blackboard through class discussion or by the individual directly on the form. Thus a basis should be provided for clearing up hazy ideas on the subjects herein presented and constructive thinking thereby stimulated. This method has proved effective in maintaining interest because it affords opportunity to draw out the students' guided thought in the place of presenting cut and dried statements.

"The desire has not been to restrict the content, but rather to offer opportunity for adjusting it to meet the needs of any given environment or emergency. To this end it is hoped that the use of these forms may assist teachers in working up others.

"It is obvious that the use of this kind of instruction must rely for results on the promotion of class discussion and of individual thinking. Teachers will find the forms most useful as a means of vitalizing instruction, for which reason a definite order of use is not recommended. Further a selected reference library or at least an encyclopedia should be available for class use as no teacher can be reasonably expected to answer the assortment of questions which this type of instruction invokes."

TABLE No. 18

Topics and Objectives for Part Time Schools

The following table gives a list of the topics on which all the different blanks bear and the objective of each.

<i>Objectives</i>	<i>Corresponding topics for blanks</i>
1. The idea that complete individual freedom is undesirable.	1. Is complete individual freedom impossible and undesirable?
2. Appreciation of the wonderful advance civilization is making.	2. What next? 3. Of what benefit is our industry and trade? 4. The history of a finished product; 5. Progress; 6. Our most important cities.
3. An appreciation of overhead costs in business.	7. Overhead charges in manufacturing and business.

TABLE No. 18 (Continued)

<i>Objectives</i>	<i>Corresponding topics for blanks</i>
4. An appreciation of the value and use of money.	8. Wealth; 9. Expenditures; 10. Money in circulation; 11. Economy; 12. How much do we need to save each day to make us financially independent? 13. Thrift; 14. How can we handle our savings to best advantage?
5. An appreciation of the factors that enter into success and failure.	15. Factors which govern success.
6. A better understanding of how to find employment.	16. Emergencies.
7. A better understanding of occupations in general.	17. Occupational analysis.
8. An appreciation of the effects of accidents.	18. Accidents; 19. How might accidents happen in factories? 20. How do accidents happen on railroad trains or on the right of way of railroads? 21. How do accidents happen where excavating or building is being done? 22. How do accidents happen on the street? 23. Injuries.
9. A working knowledge of fire prevention.	24. Fires and their effects; 25. Fire prevention.
10. An understanding of the elements of contentment.	26. Analysis of the things that produce contentment.
11. A basis for analyzing the use of leisure time.	27. A study of our leisure time; 28. Analysis of the benefits to be derived from recreations; 29. Our hobbies and what we may expect from them; 30. What hobbies did for some of our great men.
12. A knowledge of what care the body requires.	31. The care our bodies require; 32. Foods I eat; 33. The menace of germs; 34. Overstrain and its results; 35. Common repairs our bodies need and how to get the repairs made.
13. Knowledge of a minimum first aid equipment.	36. A minimum first aid equipment for our home.
14. The required minimum knowledge of our taxation system.	37. Taxes; 38. What tax money is used for.
15. The required minimum knowledge of our public and semi-public institutions.	39. Institutions established for social welfare; 40. Institutions established for public protection; 41. Institutions established for the care of the sick; 42. Institutions society has established for general utility.

TABLE No. 18 (Continued)

<i>Objectives</i>	<i>Corresponding topics for blank</i>
16. An understanding of the protection society affords us.	43. Society's ways of preventing the stronger from taking advantage of the weaker.
17. A better appreciation of what our responsibilities toward a home are.	44. Our home.
18. A better understanding of the duties of office holders.	45. Analysis of the responsibilities we have for home life.
	46. Public offices.

SAMPLE BLANKS

A few of these blanks are given below to illustrate their content; use of the boxhead device for analysis of facts; and their terse and orderly arrangement of pertinent facts and opinions. It has been necessary, of course, to curtail all spacing between items and entries. The skeleton presented, however, can readily be expanded by the reader. Arrangement of the samples given on the full sized page (8" wide and 11" long) by Mr. Ryan will help to do this, if necessary. The blanks are renumbered to conform with the numbers of the corresponding topics given in the preceding table on Topic and Objectives.

The selected samples given below are presented with no thought that exactly these topics and forms should be adapted by every continuation school teacher, but only to show the possibilities of the device in the hands of a resourceful one, skilled in its adaptations for different problems.

TOPIC 12

How much do we need to save each day to make us financially independent?

The cost of living per year is:

<i>Renter</i>	<i>Home Owner</i>
Food	Food
Clothes	Clothes
Rent	Taxes
Recreation	Recreation
Incidental	Incidental
<hr/> Total	<hr/> Total

The amount of principal required to produce the above yearly cost of living when invested in rented property netting 6% is:

	<i>Solution</i>	<i>Yearly Cost of Living</i>
	Principal required	
Example:	Rate of interest
	
	

How many years will it take you to save this amount of money, if you save 50¢ a day and keep it invested in a bank at 4%?

How many years will it take if you invest it in mortgages paying 6%?

How much would you have to save per week?

(Teach the student to use the interest curves on the following page for the solution of such problems.)

What is meant by the prime of life?

TOPIC 13

Thrift

What are the reasons by it is better to start saving money now?

Why does a person show poor judgment when he spends all of his spare money having a good time when he is young?

Is it any one's business from our own if we choose to spend all of our spare money having a good time? Whose and why?

TOPIC 16

Emergencies

A certain newspaper report reads: "Mr. Brown's first step toward success was caused by the loss of his pocketbook. He found himself with no visible means of support and while looking about for something to do discovered that hundreds of the store windows needed washing—" The story goes on to say that Mr. Brown made his way first by washing windows and later by establishing himself as the head of a window washing business. Let each member of the class imagine himself to be in Mr. Brown's predicament and suggest what he might find to do in order to get a start.

Kind of Work

How I Would Get It

Pay I Could Expect

TOPIC 17

Occupational Analysis

(Talks by persons experienced in the occupations may prove valuable in securing the data. Ordinarily this chart should not be treated as a unit lesson, but filled in as the information becomes available.)

Name of occu- pation	Is the work inter- esting	Skill re- quired	Person- ality	Re- sponsi- bility	Required training period past the 8th grade	Cost to learn	Weekly pay when learning	Weekly pay when mastered

TOPIC 18

Accidents

In the single year of 1916 it is estimated that there were 3,000,-000 industrial accidents in the United States aside from the thousands which happened on the streets of our cities. Due to these accidents the people of our country lost about \$300,000,000 worth of production while the suffering of the injured and the families of the injured cannot be measured. This would make it seem worth our while to study the causes and effects of accidents and the means of preventing them.

What are the possible effects on the family when a member becomes injured?

List below persons and group of persons who may suffer when an accident occurs.

In what ways do you think an accident affects persons who are working where it happens?

Name an unavoidable accident and explain why it is unavoidable

TOPIC 19

How Might Accidents Happen in Factories?

Kind of Accident	Causes	Prevention
------------------	--------	------------

TOPIC 27

A Study of Our Leisure Time

There are twenty-four hours in each day, eight or ten of which are spent at work, seven or eight in sleep. The remaining are called leisure hours and for the most part are spent in some form of recreation. In order that we may inventory the success we are making of our lives and determine whether or not we are "getting the most for our money" let us fill in the following form by giving the hours per week we spend at each form of recreation. Where an item is not looked on as being a recreation, the time should be given in the right hand column. This form should be filled individually by each student who should add such of his recreations as are not listed.

Estimated time per week	Estimated time per week	Name of recreation
----------------------------	----------------------------	--------------------

TOPIC 34

Overstrain and Its Results

Ways in which we overstrain	The Results
-----------------------------	-------------

TOPIC 38

What Tax Money Is Used For

Collection Unit	Rate Charges	Principal Things the Money Buys
<hr/>		
City		
County		
State		
Federal		
What taxes do property owners pay?		
Do persons avoid a property tax by being renters?		

INDEX

(The numbers refer to pages)

- Ability: variation in different individuals, 107; management vital, 186.
- Academic education: question of amount necessary for vocational teachers, 511.
- Administration: conflicting theories of, 212; discussion of, 213 ff.; (See also unit and dual control under the National Vocational Education Act); a layman's explanation of, 473.
- Admission of pupils to adolescent school, 251; organization for, 249 ff.
- Adolescent school (See vocational schools), 246 ff., function of, 251 ff.; admission of pupils, 250; individual instruction in, 252; conditions of admission, 254; specific training and education required, 257; teaching fundamentals in, 258.
- Adults: vocational school for, 299 ff.; factors to be considered, 299; working conditions, 300; character of needs, 301; effect of use of short unit courses in, 302; use of short unit courses in, 303 ff.; need for flexible and fluid organization in, 306; courses and methods, 308; call or emergency staff, 308; qualifications of teachers, 310; teacher training for, 311.
- Agricultural subjects: duties of State Boards with regard to, 430.
- Agricultural teacher training: occupational content, 522; organization for, 522; standards, 522; range of objectives, 523; general discussion of, 524.
- Agricultural vocational education: situation compared with that in trade and industrial, 407 ff.; but few type schemes used, 407; still much pick up training, 407; full-time school standard device, 407; trend towards trade extension, 408; a prophecy for, 411; Federal appropriations for, 428; requirements for, 430; social function of, 528.
- Apprenticeship: killed by pickup methods, 27; abuse of, 159; under national associations, 400. (See also Bricklaying).
- Aptitudes and interests: special, 197; capitalization of, 198; auxiliary information, 267.
- Bellamy, Edward: and the democratic state, 184.
- Bill, the N. E. A., 467.
- Biological: characteristics versus social necessity, 139.
- Blanks, for use in continuation schools, Appendix II.
- Board: need for a representative, 475; reasons for independent, 475 ff.
- Boy Scouts: utilization of project methods, 279.
- Bricklaying: plans for training in, 397; use of vestibule school for, 397; use of dull-season courses, 397 ff.; use of trade extension courses, 397 ff.
- Carry over: of thinking habits, 50.
- Change and shift of economic demands, effect of, 178.
- Class, the: in the continuation school, 342.
- Commercial vocational education: changes coming slowly, 409; schools blind to changes, 410; concentration on typing and book-keeping, 410; a prophecy, 416.

- Committee: use of pupil in continuation schools, 343.
- Compulsory continuation school (See continuation school).
- Concealed overhead: reduced by organized vocational education, 128 ff., 157.
- Conditions for training best in vocational education, 53; in vocational schools, 253 ff.
- Conference: as an educational procedure, 286 ff.; use in continuation schools, 359; conference leaders, training of, 540; job of conference leader in continuation schools, 360.
- Conservation: of human resources, 128 ff.; through vocational education, 128 ff.
- Content: specific for each occupation, 204; must be specific in vocational education, 268; development of, 268; procedure in securing, 269.
- Continuation school, 231 ff.; compulsory, 318; States established, 318; a new social agency, 319; the situation precipitated, 318; using old ideas for a new and vital problem, 319; taking the easiest way, 320; sets up a new and distinct problem, 321; and the social job, 322; problem of, 323; individual help in, 324; limited time in, 324; greatest service by, 324; still on trial, 325; what cannot be taught in, 325; the real versus the assumed situation as to, 329; what the school ought to do, 331; what the school can do, 331, 334; how the school can do it, 334; use of the clinic, 334; clinic records, 335; individual instruction in continuation schools, 334; graphing clinic records, 337; flexible program required, 339; rotating group in, 340, 341; compared to country school, 340; individual instruction in the rotating group, 341; use of the conference in the continuation school, 342; place of the class in, 342; use of pupil committees, 343; giving practice in desirable habits, 344; use of junior citizen plan in, 347; giving resourcefulness in getting facts, 350; devices for training to secure facts, 354; utilizing pupils to get facts, 354; anticipating need for facts, 355; getting pupils to think, 355; use of forms and blanks, 356; training in organizing facts, 357; use of the conference for this, 359; job of the conference leader, 360.
- Cooperative part-time vocational school, the, 225; inherent difficulties, 226.
- Correlation: organization for, 272 ff.; the project, 274; organization by subjects gives poor, 275 ff.; best secured by use of project, 279 ff.
- Costs: the irreducible—for vocational education, 209.
- Courses of study: in day schools, 266; organization of, 272; typical organizations of, 272; short unit, 273; long courses, 272; projects, 274; shop courses should dominate, 278; dominating and secondary courses, 278; general descriptive in teacher training courses, 525; for teacher training, see teacher training.
- Crafts: real truth about old, 72.
- Day vocational school: economic function of, 230; training teachers for, 533 ff.; noncooperative compared with plant school, 372 ff.
- Democracy: wastes its assets, 184.
- Departmental plan: in vocational schools, 276.
- Devices: special efficiency in vocational education, 369; for getting the training job done, 388; relative efficiency, 388, 389; comparative tendencies in using, 399 ff.
- Difficulties: in prevocational training, 136 ff.; learning, 160 ff.
- Discipline: in vocational schools, 261.
- Discovery of ability: fundamental to progress, 21; of fitness, 106; testing as a means of, 106; as a means of placement, 128; through vocational training, 129; through prevocational training, 134.
- Dual control, 213; reasons in favor of, 213 ff.; outstanding example of,

- 215; compared with single control, 214 ff.
 Dull-season schools, 235.
- Easing the beginner into his job, 160.
- Education: the reliance of democracy, 19; leisure, theory of, 71; things ignored in leisure theory, 72; pusher, 169.
- Educational procedures: the three types, 283 ff.
- Efficiency: factors in vocational education, 368 ff.; acid test of, 368; special devices, 369; comparison of training plan of a plant with a noncooperative day school, 372 ff.; relative of different training devices, 387, 388; of plans affected by occupation, 399 ff.; of various training schemes for mass education, 401 ff.; factors in teacher training, 492.
- Effort, reduction of, 175.
- Employment standards: minimum, 200.
- Environment: habits, 194.
- Equipment of the vocational teacher, 312; general theory of, 312.
- Evaluation: of three plans for teacher training, 518.
- Evening extension school, 233; teacher training for, 311.
- Experiences, first and second hand, 283 ff.
- Extension: school, 231.
- Factors: in vocational school for adults, 299 ff.; efficiency in vocational education, 370.
- Facts: giving resourcefulness in getting, 350; training pupils to get, 354 ff.; training to collate and organize, 357.
- Faulty assumptions: inability of competent worker to develop courses of study, 269; can develop courses unaided, 269.
- Federal aid: to vocational education, 423 ff.; need for, 423; social principles in, 463; Report of Commission on, 426; principles and considerations, 464; provisions of act for, 428 ff.; appropriation basis for, 428 ff.; legal requirements for, 429; on States, 430; on State Boards, 430; questions to be met, 433 ff.
- Federal Board for Vocational Education: as agent for administration of the National Vocational Education Act, 429; discretionary standards, 437; does not deal directly inside of States, 471; not concerned with institutions, 473.
- Federal interference: real vs. imaginary, 469.
- Federal program: opposition to, 457; interference, question of, 461.
- Fitness: discovery of, 106; training only real test of, 131; revealed by training on the job, 132.
- Force: democracy cannot rely on, 19.
- Forms: for continuation schools, Appendix II.
- Full-time day school, 222; problem of, 223; difficulties, 226; split program of, 223; noncooperative type, 227; typical schools, 228; organization and administration of combined adolescent and extension school, 251 ff.; present trend away from, 406.
- Fundamentals: theory of trade, 258.
- General continuation school (See continuation school).
- General education: compared with vocational education as to working conditions, 210.
- General schools: tendency to copy procedures in vocational schools, 246.
- Grants in aid: by English Government, 426; application to Federal grants, 424 ff.
- Group: relation in country school, 340; in continuation school, 341.
- Group characteristics: must be recognized, 198; in adult school, 300.
- Habits: carry over of thinking, 50; giving practice in desirable, 344.
- Hebartian lesson: use in vocational schools, 285 ff.; steps in, 286; certain special modifications of in vocational schools, 286.
- Home economics subjects: duties of

- State Board under National Vocational Education Act, 431; requirements for Federal aid, 431; teacher training for, 531.
- Home economics vocational education: the present trend, 408; practical emphasis in continuation schools, 408; tendency toward serving employed girls and adult women, 409; a prophecy, 414 ff.; Federal appropriations for, 428; teacher training for, 531 ff.
- Horizontal: release of labor, 182.
- Human effort, reducing, 162.
- Human resources: effective utilization of, 106; need of conserving, 145 ff.; conserving through pre-vocational education, 145 ff.
- Index: value of jobs, 399, 340.
- Individual: help in the continuation school, 324; treatment in, 331 ff.
- Individual: morale increased by vocational education, 61 ff.; ability, variations in, 106; and the total social job, 181.
- Industrial education (See vocational education; trade and industrial education): characteristics of teacher-training job, 535.
- Industrial subjects: duties of State Boards under National Vocational Education Act, 430.
- Information: vocational guidance through, 124; imparting, 283; first-hand, 283 ff.; second-hand, 283 ff.
- Instruction: given as needed, 167; setting up in progressive order, 172; individual in vocational schools, 249 ff.; methods cannot be based on faculty psychology or theory of formal discipline, 282; as an educational procedure, 284; distinguished from imparting information, 284.
- Intelligence: occupational, 40; all jobs require some human, 41; and the Richards's formula, 42 ff.; versus social intelligence, 44 ff.; job, 40-43; chief aim of vocational education, 42; tests, 111 ff.; tests do not show special assets, 112; quotient, 111; tests and occupations, 114; as a means of selecting workers, 112; in vocational advisement, 111 ff.
- Intelligence tests: in vocational advisement, 111; as a means of selecting workers, 112; value of, 115 ff.
- Interest: essential in subject matter, 51; strongest in vocational subjects, 53; informational vocational guidance no test of, 125.
- Invention: fundamental to progress, 22; and vocational education, 29-32; social waste of haphazard, 33; has increased demand for job intelligence, 41.
- Invention: opening the way for, 33; in vocational education, 34-35.
- I. Q.: basis of success, 111 ff.; does not indicate personnel factors, 118 ff.
- Iron man: the theory of, 69; somebody must construct, 77.
- "I. T." course (See Plan C).
- Job: training on the, 131; easing the beginner into, 160; theory of training, 202; three kinds of, 399.
- Job intelligence: defined, 40; most important in vocational education, 42.
- Job requirements: misconceptions as to, 107; morale (R. W. Kent). Appendix I.
- Junior citizenship plan, 347.
- Kent, Ronald W., 347 (See junior citizenship plan).
- Knowledge: diffusion of necessary, 27; for use, 170.
- Labor: released by machine, 180; readoption of, 180; vertical and horizontal release of, 182.
- Learning: reducing effort of, 151; by guess and try, 151; shortening period of, 166; learning difficulties, 160; period of, 174; no learning vs. learning period, 174; effort reduced by organized vocational education, 174, 175.
- Lecture method: not adapted to vocational education, 284 ff.
- Leisure: theory of education, 71; things ignored, 72; things misinterpreted, 91 ff.

- Licensing: effect on organized vocational education, 26.
- Machines: use of requires more and better training, 128.
- Management: vital to use of ability, 186; personnel, in day schools, 261.
- "Market requirements": training to, 201.
- Marking system: of general schools: not serviceable in vocational schools, 247.
- Mass problem, the, 402; comparative efficiency of training scheme for, 402, 403.
- Massachusetts: suit to test constitutionality of Federal Aid, 459.
- "Mathematics": practical, 206.
- Men: readapting, 180.
- Methods of instruction: cannot be based on faculty psychology or theory of formal discipline, 282.
- Modern occupations: real truth about, 78.
- Morale: described, 56; occupational, 56; vocational education and, 57; general and social, 58; affects individual stability, 59; promoted by vocational education, 60; individual, increased by vocational education, 62.
- Mudsill theory of education, 98.
- National Associations: schools conducted by, 386; apprenticeship committee of Master Plumbers and Steamfitters, 400; research bureau, 401.
- National Education Association bill, 467.
- National Government: future relation to vocational education in the States, 480.
- National Vocational Education Act: fields set up, 221; adoption, 427; provisions of, 428; general provisions, 428; appropriations to States, 428; description of, 427 ff.; legal requirements of, 429; main questions for school authorities to meet, 433; State Boards concerned with, 434; table of mandatory and discretionary standards constructive safeguards, 436, 437; specific standards not defined, 438; and the Federal Board for Vocational Education, 438; results of, 441; resulting stimulation of States, 441, 442; in preparing teachers, 446; other results, 447; the other side of the picture, 450; changes in, 454; opposition to, 457; constitutionality of, 458.
- Nature: command over extended by vocational education, 185.
- "Non-Com": opening the way for, 31.
- Noncooperative full-time day school, 227; difficulties of, 227; some typical schools, 228.
- Objectives: in agricultural teacher training, 522, 523.
- Occupation: success in, 111; conditions of, 114.
- Occupational: content of agricultural teacher training courses, 522; special tests, 117.
- Occupational competency: requirements for (see qualifications of teachers).
- Occupational intelligence: chief aim of vocational education, 44; versus social intelligence, 45.
- Occupations: multiplicity of, a difficulty in vocational guidance, 136.
- Opponents: of vocational education: misinterpret real social function, 94.
- Opportunity school, the, 235.
- Organized vocational education: promoted by licensing, 26; as a selective agency, 129; turnover reduced by, 174.
- Organization: for efficient vocational education, 222, 249; conditions to be met, 249 ff.; class not suited to vocational school, 252; of courses in day school, 272; of past experiences as an instructing device in vocational schools, 287 ff.; of agricultural teacher training, 522.
- Overhead: concealed, 157.
- Part-time school, 231; compulsory part-time school—clinic card, 335 ff.; training, 383 ff.

- Personnel management: in day schools, 261.
- Pick up training: abandoned by professions, not by trades, 25 ff.; methods of, 27; great mass of workers still trained by, 26; inefficiency, 13 ff.; social cost, 152; concealed cost of, 128 ff.; beating it, 387.
- Placement: through vocational education, 128; through prevocational training, 135; of trained fitness, 130.
- Plans for teacher training (see also teacher training): Plan A, 489; plan B, 490; plan C, 491; characteristics of different plans, 492, 493; curricula, 497, 498; plan B, discussion, 505; not much used, 505; plan C, description, 506; objective, 508, 509; constructing curriculum for, 507; character of curriculum, 508; functioning of curriculum, 509; objections to, 510; academic education, 511; general qualifications, 513; intelligence, 514; length of training period, 516.
- Policies: for local director of vocational education, 395.
- Prevocational education, 134 ff.; discovery and placement through, 134; needed as supplementary to vocational education, 136; some permanent difficulties, 139; futility of present plans, 140; place in educational progression, 138 ff.; only feasible plan, 143.
- Problems: in continuation schools, 323 ff.
- Problems: in vocational education: changing conditions in, 29.
- Profession improvement: of teachers in service, 519; versus pre-employment training, 519; under plan A, 519; under plan C, 520; different plans applied to different fields, 521 ff.
- Program: split in full-time day school, 223.
- Progress: discovery and invention fundamental to, 21.
- Progressive order: setting up instruction in, 172.
- Project: as an organization device, 274; as a correlating device, 277; utilization by Boy Scouts, 279; agricultural, 280; industrial, 280; not revolutionary, 281; not so easy as traditional methods, 282.
- Pusher education: need for, 84; as a device in vocational education, 169; present trend toward, 405 ff.
- Qualifications of teachers: shop and technical, 288.
- Quantity production: requires more and better training, 179.
- Rating of types of schools, 238.
- Rediscovering America, 164.
- Reference and handbooks: necessity for training in use of, 284, 285.
- Related subjects matter, 541.
- Repetitive training: in day schools, 260; necessary in vocational education, 199.
- Representative board: need for, 475.
- Requirements of Vocational Education Act (See Standards).
- Residential teacher training course: plan A, 493; characteristics of, 494; some disadvantages of, 495; character of curricula, 497; functioning of curricula, 500; difficulties, 501.
- Resources: effective utilization of human, 106.
- Results: of National Vocational Education Act, 441.
- Richards' formula: job intelligence in, 42; doing ability in terms of, 239 ff.
- Rotating group, the: in the country school, 340; in the continuation school, 341; individual instruction of, 341.
- Ryan, J. T.: blanks prepared by, Appendix II.
- Schools (see vocational schools): some typical, 228; the adolescent, 246 ff.
- Selected group necessary for efficient vocational education, 198.
- Self-contained country, the, 19.
- Service, theory of, 205.
- Shop: small: persistence of, 75.

- Shop training: should be dominant course, 278.
- Short Unit Courses: effect on adult school, 301; use in schools for adults, 302, 303.
- Single control, 212; reasons in favor of, 212.
- Skill: diffusion of necessary, 27; making available rapidly, 27; increased by vocational education, 62.
- Smith-Hughes Act (See National Vocational Education Act).
- Social: loss of wasted years, 106, 109; cost of pick-up methods, 107, 108, 109, 157; principles in Federal Aid, 463.
- Social agencies: the continuation school a new, 321, 322; a social intelligence versus occupational intelligence, 44.
- Social function of agricultural education, 525 ff.
- Social intelligence: contribution of vocational education, 49.
- Social job: and the individual, 181; and the continuation school, 322.
- Social organization: ideal, 184.
- Social stratification: affects character of vocational education, 63.
- Specialist versus specialized worker, 70.
- Specific content: correct method of securing, 283 ff., 204, 269.
- Specific: training in the adolescent school, 257; needs must be, 204, 205, 206; necessary in vocational education, 197 ff.; content necessary in vocational education, 268 ff.
- Stability: affects morale, 59.
- Staff: call or emergency, for adult schools, 308.
- Stages: in vocational learning, 384; illustrative table, 384; time allotment for, 385; in shop career, 384, 385.
- Standards: training to minimum employment, 200; of National Vocational Education Act, 429 ff.; vital to local authorities, 434; mandatory and discretionary, 435; table of mandatory and discretionary, 436, 437; mandatory imperative, 436, 437; discretionary as safeguards, 437; specific standards not defined, 438; for agricultural teacher training, 522.
- State Boards for Vocational Education: conducting teacher training courses, 289; required by National Vocational Education Act, 430; teacher training and supervision of, 433; concerned with Federal standards, 434.
- States: stimulation of by National Vocational Education Act, 441, 442; promoting schools and service, 446; the other side of the picture, 450; certain State and local weaknesses, 453.
- Study: courses of, in day school, 266.
- Subject matter and correct thinking, 47; interest essential to, 51; used in special sense, 267; organization of, 275-282 incl.; by special subjects, 276 ff.; by parallel courses, 276 ff.; related, 541.
- Summaries of types of part-time schools, 236—as to organization, 262; of plant and school training characteristics, 376.
- Teachers: qualifications of day school, 288; shop and technical, 288; desirable qualifications, 288; predominant factor in vocational education, 291; qualifications for adult schools, 310; call or emergency staff, 308; of technical subjects, 542.
- Teacher training: for regular schools, 288, 289; for vocational teachers, 288, 289; special training courses, 288, 289; delegated to State universities, 289; directed by State Board, 289; State operation gives best results, 289; difficulty in securing, 289; difficulties in training on the campus, 289, 290, 291; extension courses, 291; teacher the predominant factor, 291; for school for adults, 311; general theory of, 312, 313; the job to be done, 488; the three plans, 489; the first plan, 489; the second plan, 490; the third plan, 491; characteristics of the three plans, 491, 492; efficiency factors

- in teacher training, 492; characteristics of residential course, 493; functioning of curricula, 500; some disadvantages, 495; character of curricula, 497; trade content, 499 ff.; professional content, 500; difficulties as to segregated schools, 501; how such curricula came about, 503; plan B, description of, 505; plan C, objective, 506 ff.; character of curriculum, 508; functioning of curriculum, 509; objections to, 10 ff.; degree of academic education, 511; general qualifications, 513; intelligence, 514; length of training period, 516; the three plans evaluated, 518; professional improvement: under plan A, under plan C, 519; professional improvement versus pre-employment teacher training, 519; agricultural teacher training, 521; occupational content, 522; organization, 522; standards, 522; range of objectives, 523; general discussion of, 524; home economics teacher training, 532; of teachers for day schools, 535; of trade and industries, 535; the isolated teacher, 537; training plant instructors, 537; of foremen as instructors, 537; of conference teachers, 540; discussion, 535; training of teacher trainers, 540; development of teacher training, 544.
- Teacher trainers: training of, 541.
- Teaching: a bartering ability for, 7; material, lack of functioning, 164.
- Team play—between man and machine, 177.
- Technical teacher, the, 543.
- Test: a layman's, 45.
- Tests: as a means of discovery, 110; for general intelligence, 111; value of intelligence tests in selecting workers, 115, 116; occupational, 117; entrance tests, 117; trade value of, 120; table of comparative values, 122, 123; only real test is through training, 131.
- Theories of education: leisure theory, 70, 71; mudsill theory, 98; fundamental for vocational education, 192, 193, 194 ff.; as to environment, 194; as to tools and equipment, 194; as to specific habits, 197; as to capitalization of interests and aptitudes, 197; as to minimum employment standards, 200; as to meeting market demands, 201; as to training on real jobs, 202; as to source of content, 203; as to meeting specific group needs, 204, 205; as to group characteristics, 207; as to elastic administration, 208; as to irreducible minimum of costs, 209; synopsis of theories regarding vocational education, 210, 211; conflicting, 212 ff.; unit control, 212; of fundamentals, 258.
- Theory: of Iron Man, 69; of carry over, 50.
- Thinking: carry over of habits of, 50; best training, in vocational education, 54; for a purpose, 171.
- Trade extension school, 232; part-time type, 232; evening extension type, 233; dull season type, 235; opportunity type, 235.
- Trade and industrial vocational education: Federal appropriation for, 428; requirements for Federal aid, 429; training of teachers for, 534; characteristics of teacher training for, 535; plans for training, 489 ff.
- Trade subjects: duties of State Boards under National Vocational Education Act, 430.
- Trade: tests, value of, 120.
- Trade training: theory of fundamentals, 258; repetitive, 260; for efficient use of leisure, 96, 97, 98 ff.; as a selective agency, 129; to market requirements, 201.
- Training: of plant instructors, 537; foremen as instructors, 537; of agricultural teachers, 521; of home economics teachers, 530; trade and industrial, 534; of day school teachers, 535; on the job the best, 131; facilities, pathetic lack of, 163; environment, theory of, 194; repetitive, 260; schemes, comparative efficiency of, 402; schemes, apparent trend, 405; in agricultural education, 407, 408.

- Training period—length of, for teacher training, 516.
- Training, vocational (see Vocational Education).
- Trends: away from full-time day school, 405, 406; towards working through local organizations, 406; in agricultural education, 408; in home economics, 408; in commercial education, 409.
- Try-out: on the job, 119.
- Turnover: reduced by organized vocational education, 174.
- Types of vocational schools: comparative analysis, 238, 239. (See vocational schools).
- Unit control, 212; results of, 214; reasons in favor of, 212, 213; compared with dual control, 216 ff.
- Vertical: release of labor, 182.
- Vestibule: stage in training, 385 ff.; school, 385 ff.
- Visualization: inability of occupationally competent individual to visualize content, 269.
- Vocational adjustment—discovering fitness, 108; during wasted years, 109; methods crude, 109; schemes for, 110.
- Vocational advisement (See prevocational education).
- Vocational education: defined, 4, 5; broad and narrow use of term, 4; nothing new, 5, 6; in the family, 6; and the social recruit, 6; conscious and unconscious, 9, 10; development of organized, 7; present stage of development, 7; public versus plant, 7; steps in the development of, 11; in relation to modern conditions, 13; a social efficiency device, 14; and democratic progress, 14, 15; and changed conditions, 29; of the non-com, 31; contributes to social intelligence, 49; best training in thinking, 53; increases skill and capacity of workers, 62; affected by character of social stratification, 62, 63; increases morale of individual, 62, 64; promotes social morale, 60; makes parasites into workers, 61; discovery and placement through, 128; as a selective agency, 129; actual demand for, 86; social functions of, 94; as a pusher device, 169; extends command over nature, 185; characteristics of, 192; fundamental theories of, 196, 197; a social device, 198; kinds of, 220; the four divisions of, 221; organization for efficient, 222; other forms of, 406, 407; need for, 423; Federal aid for, 422 ff.; Commission on National Aid for, 423; need for National grants for, 424; social principles for grants in aid, 426; fundamental ideas involves, 427; act, 428; general provisions, 428; essential to National welfare, 425, 426; vs. State and local politics, 440; future relation of National Government to, 480 ff.; requires teachers, 487. (See also theories of).
- Vocational Education Act: results from, 441; no change in basic, 454, 455. (Also see Federal Aid.)
- Vocational guidance: through information, 134; no test of interest, 135; through prevocational training, 135; multiplicity of occupations a difficulty, 136.
- Vocational schools: types of, 220 ff.; full-time day, 222; problem of, 223; program of, 223; economic function of, 230; extension school, 231; part-time school, 231; conditions of success, 228 ff.; continuation school, 232; extension school, 232; evening extension school, 233; dull season school, 235; opportunity school, 235; the adolescent school, 246 ff.; compared with general schools, 246 ff.; organization of the adolescent school, 250; admission of pupils, 251; individual instruction, 252; conditions of admission, 253; standards of promotion, 256; specific training, 257; teaching fundamentals, 258; working conditions, 259; for adults, 299 ff.; factors to be considered, 299 ff.; group characteristics, 300; working conditions, 300; character of needs, 301; effect of short unit courses, 302.

- Vocational teachers—academic requirements, 511; general qualifications, 499 ff.; (see also Teacher training) intelligence of, 514.
- Vocational training (See Vocational Education).
- Wasted years, 109.
- Weaknesses: certain local and State, 453.
- Webb, Sydney and Beatrice, 426.
- Wisconsin outstanding example of dual control, 215.
- Worker, the: adaptation and re-adaptation, 24; skill and capacity increased by vocational education, 62; specialized versus specialist, 70.
- Working conditions: in vocational schools, 258; devices for, 283; in adult schools, 300.
- Working theories: summary of, 210.

WITHDRAWAL

LC1043 .P8
Vocational education in a democracy
Gutman Library APD6090



3 2044 028 967 016

